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ON POSTURE DURING AND IMMEDIATELY AFTER OPERATION WITH REFERENCE TO GENERAL ANESTHESIA*

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SURGEONS who believe in the value of posture in the course of operation as well as in the course of the after-treatment will not fail to employ this aid for the benefit of their patients.

Serious complications concerning the heart in consequence of general anesthesia are rarely seen in present day surgery. That terrible experience, the so-called syncope of the heart, which many of us had occasion to observe in former years when chloroform was administered, even in the hands of the most experienced, is no longer met with, since straight ether anesthesia and anesthetic mixtures have come to the fore. We are using nitrous oxide plus oxygen with and without the addition of ether; and recently ethylene has been added to our available anesthetics. Synergistic anesthesia, with its wonderful possibilities also has come into use, and last, but certainly not the least colonic ether anesthesia is making well-deserved headway. Hence it is not surprising that we hardly ever see any fatal or even real critical accidents to the patient's heart as a result of general anesthesia on the operating table.

What we do see off and on are complications in connection with the lungs, mostly due to aspiration during or immediately after operation: aspiration into the bronchial tree of blood, mucus or mucopus during operations within the mouth and naso-pharynx (nasal septum, tonsils, adenoids, etc.) and further the aspiration of gastric contents during and immediately after the operation in consequence of vomiting while the patient is still under the influence of the anesthetic.

After the period of wholesale extraction of teeth came the flood of tonsillectomies, when often 10 to 20 or more of these operations were done by one man in the course of a few hours. In order to save time they were usually carried out under general anesthesia. Now we all know that in infants and young children aspiration of blood during and after tonsillectomy is very rare, due to the anatomical construction of the pharynx; but in adolescents and adults, these aspirations into the ramifications of the large bronchi occurred frequently. The degree of the seriousness of the resulting complications depended on the infectiousness and the quantity of the material aspirated. From acute ordinary and putrid bronchitis to the formation of a single or multiple abscesses of the lung, following local gangrene, all gradations were observed.

When these serious complications were noticed and when it was recognized that they were mostly due to aspiration, it was

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but natural that in this, our age of prophylaxis, the demand should be made upon anesthetists to find ways and means to avoid this aspiration. And it has since been shown that it can be avoided, principally by means of the continued or intermittent use of the electric suction pump.

I know that there are those who will not admit that direct aspiration of blood or mucus or pus is the principal cause of the pulmonary complications observed, and who claim that they are due in the majority of cases to an embolism of an infected thrombus thrown into the pulmonary circulation by way of the right heart. To my mind that seems far-fetched. Of course, this type of pulmonary infection takes place in the course of diseases throughout the body, but personally I am convinced that hardly more than ten per cent of the cases of lung abscess are due to such a cause. The mere fact that prompt cleansing of the bronchial tree at the hands of an experienced bronchoscopist can quickly abort the threatening complication speaks volumes for the assumption that direct aspiration is the principal cause. And how about the serious lung complications seen after aseptic operations done in an absolutely aseptic field? How should infected thrombi be formed in these cases?

As stated before, anesthetists have learned within the last decade how to avoid to a great extent the aspiration of blood, etc., into the bronchial tree in the course of naso-pharyngeal operations. But how about the aspiration of stomach contents due to vomiting? There is no question that the greatest number of complications that we surgeons still see in the course of the after-treatment is due to this cause. Evidently this was recognized early, for since the very beginning of general anesthesia the rule has been that the patient's stomach must be empty when he is wheeled to the operating room. If vomiting does occur only some mucus that has collected within the stomach will then be brought up. It is to be regretted that this golden rule is not always strictly followed either by the patient himself or by the nurse in charge, much to the detriment of the individual undergoing operation. Let us all insist on *an empty stomach* as an important preliminary to operation.

From a prophylactic point of view the necessity of enlarging the field of regional and local anesthesia cannot be emphasized too much. To my mind it should take the place of general anesthesia wherever this is feasible and I know I do not stand alone in this demand. Prepare the patient for regional and local anesthesia the same as you do the patient whom you put under general anesthesia. Every specialist in anesthesia should become a master in preparing a patient for regional and local anesthesia, no matter in what part of the body the surgical work is to be done. Nevertheless, we shall not be able to get along without general anesthesia.

If the patient is kept under the anesthetic properly and evenly by a conscientious, ever-vigilant anesthetist who sticks to his work, does not peep over the head of the patient to watch the course of the operation more than his anesthesia, there is little danger of vomiting. If the man at the helm pays proper attention, he will note the signals of an approaching vomiting spell. The first contractions of the diaphragm and that peculiar motion of the abdomen and of the thorax will tell the experienced anesthetist that this act of regurgitation is coming on. Often it occurs toward the end of the operation when, in many cases, the patients are allowed to come out of the anesthesia. That is the moment when the experienced anesthetist will tell the surgeon: "I have to place the patient in Trendelenburg's posture," or the surgeon when noticing the approaching vomiting spell, will himself call out: "Trendelenburg's posture," provided always that the case permits it. With the modern operating-table one turn of the sidewheel will place the patient's head low and the pelvis slightly elevated. The danger of aspiration is immediately averted,

a typical step in prophylaxis. The regurgitated stomach contents cannot run uphill. If the head is turned well to one side, these contents will flow out at the lower angle of the mouth. Thus the prompt placing of the patient in a slight Trendelenburg's posture before the vomiting has really started, will avoid aspiration of stomach contents—a simple maneuver worth remembering.

Toward the end of the operation I think it is still the custom among the majority of anesthetists—inasmuch as general anesthesia should be as brief as possible—to allow the patient gradually to come out of the anesthesia *on the operating table.* Is that correct? Is it wise to do so? To my mind it is not. I have often watched with keenest interest the procedure carried out by Dr. Thomas L. Bennett, the well-known New York anesthetist. In special cases, if asked beforehand by the surgeon or by the patient—who perhaps is afraid of the frequently occurring post-operative vomiting of which friends have told him—to try to prevent the vomiting, he does not allow the patient to come out of the anesthesia towards the end of the operation, but rather puts him under deeper, and then, while the wound is being sewed up, introduces the stomach tube and does a thorough gastric lavage. If the remnants of the lavage fluid are made to come out completely, there is then no longer any chance for vomiting, because the stomach is completely empty, and the danger of aspiration of stomach contents towards the end of or immediately after the operation is definitely eliminated. I do not know how you anesthetists feel about this point. I have many a time discussed it with other surgeons, as also with the anesthetists at our hospital and suggested whether it would not be advisable for all of you to take up this question of adding a carefully conducted gastric lavage under deeper anesthesia at the time of winding up the operation, on the table—to my mind best with the patient in a slight Trendelenburg's posture.

All the preceding remarks have had reference to occurrences during the operation. Now a word about the time immediately after operation. I shall never forget an experience I had about ten years ago: returning the patient to his bed, lying on his back, after an uneventful gastro-enterostomy there was a sudden gush of stomach contents with aspiration. I need not emphasize that there followed an anxious time for the expert anesthetist who had the case in hand, as well as for ourselves and the members of the family, until we knew that proper respiration had been reestablished and the likelihood of an acute pulmonary inflammation setting in had passed. That observation taught me that proper posture *immediately after operation*, also is a most important point. On the stretcher, when returning the patient to his bed and in bed, Sims' posture, takes the place of Trendelenburg's. From that time on, I have insisted that when the patient is placed from the table on to the stretcher, he is not placed upon his back, but is immediately turned into Sims' posture, so that again the lower angle of the mouth is the lowest point with reference to pharynx and stomach. Then, if he vomits on the way to his bed, the gastric contents have to flow out of his mouth; he cannot aspirate them. The only time that this rule is waived, is when the operation as such, just finished, contraindicates it.

Do not let us forget that the seriousness of the complication resulting from aspiration also depends on the virulency of the gastric contents and the quantity that has entered the bronchial tree. The mildest sequence is an acute infectious bronchitis, next the formation of one or more pulmonary abscesses due to local gangrenous pneumonitis, and third, necrosis of the lung, massive acute gangrene, which usually takes the life of the patient, no matter whether operated upon or not.

To illustrate what has just been said, let me give you in brief outline the following two cases:

Extirpation of gall bladder and appendix in a man of 36, at a private hospital. In the midst of a normal technical procedure sudden vomiting spell; patient's face becomes cyanosed; artificial respiration is required; respiration restored. The same evening, temperature 104°; incipient, violent, septic bronchopneumonia; anxious days followed. As soon as the patient could be transferred to the Lenox Hill Hospital where we had the regular services of our bronchoscopist, we carried out what had been in our mind to do for many years no matter how seriously sick such a patient is, whether high fever is present or not, immediate bronchoscopy with aspiration of the contents of the trachea and bronchi in order to try to cut short, or at least alleviate what is otherwise bound to follow. If a bronchoscopist can be on hand immediately after aspiration occurs, the cleaning of the bronchial tree is of course carried out at once. In the case cited it required almost a year of regular bronchoscopic treatment, which was conducted by the late, brilliant Dr. Lynah, the consulting bronchoscopist of the Lenox Hill Hospital, to cure this patient who in course of time gradually developed two distinct septic lung abscesses.

Another case: Extirpation of gall bladder and appendix. Anesthesia in the hands of an expert nurse, who knew well what she was doing. The operation had been finished and the dressings were applied, when the patient, a very muscular man, began to show signs of vomiting. I called out loud: "Trendelenburg's posture; quick!" but before it could be carried out, a tremendous vomiting spell occurred; deep cyanosis; definite aspiration; returned to his bed. The same evening high fever; lung complication. Fortunately, this patient did not develop a lung abscess, but an acute fetid bronchitis with a great deal of continuous coughing, day and night. On the tenth day after operation, there was seen a large amount of bloody discharge in the hitherto dry dressings: the continuous coughing spells had burst the deep layer sutures of catgut. The silkworm gut retention sutures were still in place when the dressing was changed; but coils of the small intestine had prolapsed. Immediate re-suturing, this time with through-and-through silk, without anesthesia. After a number of days and a subsequent suppuration of one of the parotid glands, the patient recovered.

These two cases show what a surgeon may be called upon to go through in fighting a pulmonary complication, the occurrence of which had had nothing whatever to do with his personal work. Still, he is the man who has to shoulder the responsibility. Therefore, it seems to me, we should all make it a point in this age of prophylactic medicine and surgery, to prevent the possibility of the aspiration of stomach contents, which can be easily done by the simple method of posture I have mentioned, during and particularly also after operation.

I should like to mention one more useful posture after operation, although anesthetists are not so particularly interested in this, as it concerns the surgeon's after-treatment: Yet I know that every anesthetist loves to hear that the patient who has been under his immediate care for a number of minutes has come out all right in the end and has developed no post-operative complications. I am referring to that complication which may set in later—usually in the course of the second week of the after-treatment—thrombosis of the left femoral vein, which involves the possibility of a pulmonary embolism. The occurrence of this complication is considered not to be under our control; we surgeons are not supposed to be responsible for it. As you are aware, a thrombus usually occurs within the left femoral vein, perhaps in 99 per cent of the cases, owing to anatomical reasons. If it occurs, particularly when this happens in a private home, I am sure the surgeon will never forget the experience. It is one of the most annoying post-operative complications, setting in when the patient is on the highway of recovery, and the attending surgeon has perhaps assured the family that he is out of danger. Nobody can give a definite prognosis of thrombosis of the femoral vein, but the great danger of a possible pulmonary embolism is hanging over the patient. Can we prevent the thrombosis. I think we can, and that in a comparatively simple way. For more than 25 years I have practiced posture during the after-treatment, until the patient is out of bed. I have been insisting, in ward as well as in private cases, that the patient is

put in a slight Trendelenburg's posture. By the simple means of placing blocks under the lower end of the bed, the blood is made to descend, and inasmuch as it is by gravity running downhill towards Poupart's ligament, it will from there rush up, one might say, to about the level of the renal vein, from where the sucking action of the right heart will assist in doing the rest, viz. make it enter the right auricle. Of course, care is taken that the upper part of the body is sufficiently elevated in order to avoid annoyance to the patient.

I can conscientiously state that since this posture has been employed—and the method soon became a routine treatment with me and my assistants—we have seen no more thrombosis of the left femoral vein; a great assurance to the surgeon and also to the interested anesthetist, not to speak of the tremendous advantage to the patient.

Let me refer to one more point, which although it does not clearly belong to the subject under discussion, is worth mentioning from the viewpoint of prophylaxis. It has been seen in observations made at Prof. Bier's surgical clinic in Berlin, that if a patient developed symptoms of bronchitis due to ether anesthesia, and he received 8 drops of ether in an equal amount of sterilized olive oil intramuscularly, without delay, repeated once in 24 hours if necessary the development of pneumonia could be prevented in 185 out of 187 observed cases. The method is now being tested at the Lenox Hill Hospital. In colonic anesthesia the ether is mixed with olive oil, according to the rules laid down by Gwathmey, so that the ether will be given off very slowly. The same occurs with the intramuscular injection. According to animal experimentation ether produces an acute hyperemia within the bronchi and their divisions with an increased discharge of mucus, which will make the bronchial secretion more liquid. Usually in four to six days the danger of a pneumonia had been averted.

It certainly seems worth while to try these simple means which have also been found to be of advantage in typical chronic bronchitis.

LATE RESULTS IN EMPYEMA THORACIS IN CHILDREN OPERATED ON BY THE AUTHOR'S METHOD*

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THE conditions which the surgeon has to meet in treating empyema thoracis are, broadly speaking:

1, the presence of pus in the pleural cavity;

2, the retraction of the lung;

3, the poor general condition of the patient, who may be suffering from complications, or from associated diseases, or both;

4, the thickening and infection of the pleura;

5, occasionally adhesions.

Any form of direct treatment must therefore aim to:

1. Evacuate the pus that is in the pleural cavity at the time of the operation and allow complete drainage of the pus that will form later. (The means used for drainage must not, however, be the direct cause of pus production.)

2. Favor early gradual expansion of the lung. (Lung expansion should be simultaneous with pus drainage while physiological negative blood pressure in the chest is preserved.)

3. Take into consideration and meet the peculiar conditions and needs of each individual patient.

4. Help the natural forces in bringing the pleura back to normal physiological conditions.

5. Dispose of the occasional adhesions.

It is essential that these five factors work harmoniously, and each help the other. If these factors do not work harmoniously they will work antagonistically, each handicapping the other, as would a team of horses that is pulling in opposite directions.

In order to be rational the direct treatment of empyema thoracis must be based on two essential principles. One is physico-physiological, the other physico-pathological. The physico-physiological principle is: *the pleural space occupied by the fluid must be filled again by the lung or in some manner obliterated.* This principle holds true, whether the fluid is purulent or not, whether thick or thin, whether adhesions are present or not and whatever are the general conditions, the age, temperament, or sex, the pathogenesis and the presence or absence of complications. The time treatment must be continued will be exactly that required to fill the space occupied by the fluid, either by the lung itself, or by a surgical collapse of the chest's bony cage.

It is self-evident that any method of treatment that does not preserve the negative pressure of the pleural cavity will fail to effect a rapid cure. Evacuation of the pus contained in the pleural cavity, while the negative pressure is preserved, is the fundamental, basic physico-physiological principle of our direct method of treating empyema thoracis.

The physico-pathological principle is: the fluid present in the pleural cavity, whether clear and sterile, or purulent, *always*, represents a means of defense of the organism. This fluid prevents rubbing of the inflamed pleuras against each other: it acts as a splint against expansion of the lung: it is the means, and a most effectual one, employed by nature to keep the inflamed organs at rest. Consequently, the abnormal fluid found in the pleural cavity, whether clear and sterile or purulent, should not be evacuated if the cause which compelled the pleura to produce it is not also removed, or until its activity has ceased. The early expansion of the lung would only tend to the renewal of the activities of the pathological process.

* Read before the New York Academy of Medicine, Section of Pediatrics, March 11, 1926.

Exceptions to this rule are to be made for removal of small quantities for diagnostic purposes, and removal of larger quantities in order to relieve excessive pressure as often as the patient's comfort requires until the process that caused the accumulation of fluid has subsided or is removed secundum artem. The amount removed each time should *not help the expansion of the lung of the affected side*, but only relieve pressure on the mediastinum and the other lung and make the patient comfortable. An exception may also be made in the rare cases where the pleural fluid is so highly toxic as to imperil the patient's life.

The line of treatment must take into consideration mortality, immediate and late: the more or less rapid and more or less complete or ideal recovery. Immediate and late mortality is favored by general poor management of the case, too early operation, general anesthesia, improper operative technic; late mortality is favored by complications due to improper operative technic and poor after-treatment. Therefore we must:

First, study each case carefully. Do not take for granted that the case is a simple one. The most difficult and complicated case at first might appear to be a very easy and simple one. Study carefully the condition of the lungs, mediastinum, diaphragm, heart, kidney, and other organs, and such complications as constipation, anemia, poor digestion, neurotic conditions, tuberculosis, etc. Meet the peculiar needs of each patient according to age, sex, temperament, surroundings and other conditions.

Second, remember that food plays an important part in helping this class of patients. Abundant protein diet, pleasing to the patient's taste, supplemented with sugar and vegetables, will help a great majority of patients who, generally speaking, must be overfed, when it is possible. Arsenic, judiciously employed, is also very helpful.

Third, delay operation, as outlined above.

Fourth, use local anesthesia in all cases. *General anesthesia in empyema is a surgical crime.*

Fifth, avoid injuring the diaphragm, entering the peritoneal cavity, wounding intercostal blood vessels. *Do not break adhesions.* Doing so opens new avenue to infection, causes hemorrhage, favors tearing of lung and pleura, formation of more adhesions; expansion of lung is not helped. Avoid collapse of patient by preventing rapid inrush of air in pleural cavity and too sudden evacuation of great amount of pus.

Sixth, after operation make the patient comfortable. The younger the patient the more necessary it is to avoid anxiety and suffering.

Remember that the pleural cavity affected by empyema becomes a locus minoris resistentiae and therefore in order to avoid recurrence a careful postoperative treatment is indispensable.

The author's method fulfills all the desiderata for the treatment of empyema thoracis. *It realizes the ideal of every thoracic surgeon, that is: perfect closed drainage of the thoracic cavity with resulting physiological expansion of the lung. This method shortens the time of treatment to an average of ten to twelve days,* is absolutely painless, and is safer than any other. By it eighteen children and over two hundred adults have been operated on without mortality.

Author's Operation. Before operation aspirate some pus when a very large amount is present. To be precise: supposing the operation is scheduled for 11 A.M., pus should be aspirated at 8:30 A.M. and again at 10 A.M. These aspirations will lessen the danger of collapse at the time of operation and should be made in the intercostal space in which the incision is to be made. The intercostal space selected generally is between the eighth and ninth or ninth and tenth ribs, the incision being made in the scapular line.

Position of Patient. When possible, the patient should be operated on in the sitting

position, otherwise in the lateral prone reversed Trendelenburg position. The hand on the affected side is put on the opposite shoulder, and a pillow is put under the last ribs of the healthy side along the axillary line. The position must be comfortable, widen the intercostal spaces and allow the pus to drop in the costo-diaphragmatic angle by gravity.

Anesthesia. Local anesthesia must be

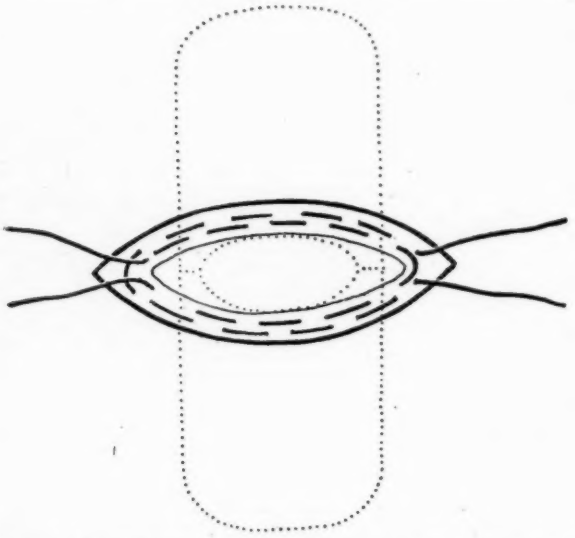

Fig. 1. Double purse-string suture, applied in order to tighten tissues (except skin) around the cannula (dotted line).

employed in all cases. I use novocaine (1 to 300)-caffein solution prepared immediately before the operation.

Incision. Length three to six cm. according to the thickness of the thoracic wall, parallel and close to the upper border of the lower rib when only the intercostal space is opened. In very young children, when the intercostal spaces are exceedingly narrow and a rib is to be resected, the incision is carried down to the rib at an even distance between its upper and lower borders. When rib or pleura is exposed inject more anesthetic solution, and, while waiting for complete anesthesia, place two purse-string sutures made with chromized catgut No. 2 or 3, each suture commencing and ending at an opposite angle (Fig. 1). These sutures must include all soft tissues except the skin and are to be tied later. During inspiration open the pleura, parallel to rib, about one and a half cm. and introduce the author's cannula. When a rib has been resected, preserve the periosteum intact and incise the posterior layer of periosteum and pleura in the middle line parallel to the borders of the rib. In this way injury to the blood vessels will positively be prevented.

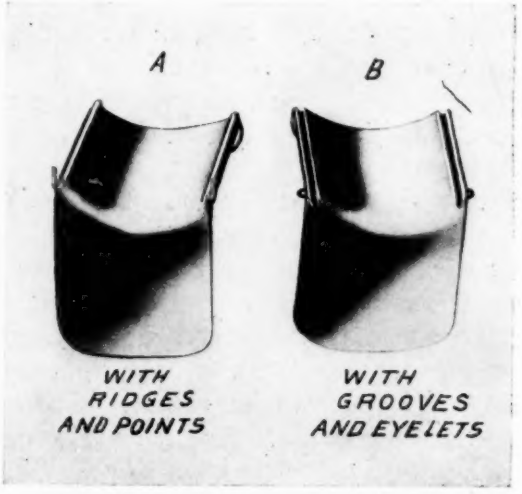

Fig. 2. Author's cannula. *A*, upper half of cannula with ridges and points. *B*, lower half with grooves and eyelets (ring omitted). The two valves fit into each other.

Author's Cannula. This special cannula is made of thin nickel-plated metal and is composed of two halves which fit snugly into each other and form an oval channel (Fig. 2). Each half has two flanges, one short and roundish, another long and flat. The upper half is provided with two points near the long flat flange and the edges between the flanges form two ridges (Fig. 2, A). The lower half is provided with eyelets and a large ring, and its edges form two grooves (Fig. 2, B). When the two halves are put together the ridges and the points of the upper valve fit into the grooves and the eyelets of the lower half. Between the upper part of the ring, which is part of the lower half, and the flat flange of the upper half, there is a space which allows the insertion of a rubber valve (Fig. 3, 4). The ring is covered with a cap that is secured in place by a

slot (Fig. 4) which fits into a notch found on the ring. This cap ends with a short metal tube to which is attached a rubber tube that leads into a bottle.

Insertion of the Cannula. The insertion is done as rapidly as possible, without attempts to evacuate the pus. The lower valve is introduced first. Hold the long flange between the index finger and thumb, introduce the short flange and

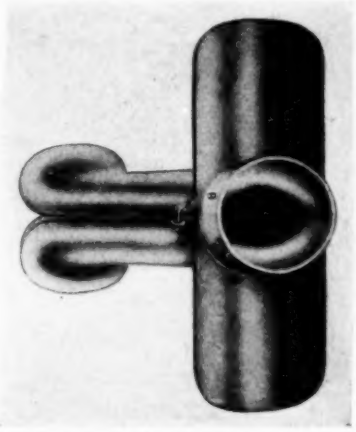

FIG. 3. Author's cannula. Showing: the two valves fitted into each other, forming a large oval channel; cap to be applied to ring in lower half of cannula; rubber valve that fits in space left between cap and ring, and completely closes the oval channel formed by cannula.

push the cannula in with a slight upward turning-in movement (Fig. 5) until the short flange has turned around the rib and entered the pleural cavity. Then, lowering slightly the lower half, introduce the short flange of the upper half, by applying the ridge of the upper half within the groove of the lower half (Fig. 6) and make it slide down into the pleural cavity over ridge of lower half by downward movement. When the short flange has entered the pleural cavity, put the two halves together by inserting the points of the upper half into the eyelets of the lower half (Fig. 7). Introduce immediately the rubber valve (Fig. 4) into the space found between the long flange of the upper half and the ring. Now you may proceed slowly for, the pleural cavity being closed, you need not fear collapse of the patient, who begins to breathe easily and comfortably. See that the rubber valve lifts and falls back at each respiration, allowing some pus to escape. Apply the cap, (Fig. 4) to the ring of the lower half of cannula, securing it in place by introducing the little notch found in the ring into the groove found in the cap. Tighten and knot the two purse-string sutures, and close the skin around the cannula with silkworm-gut sutures: apply

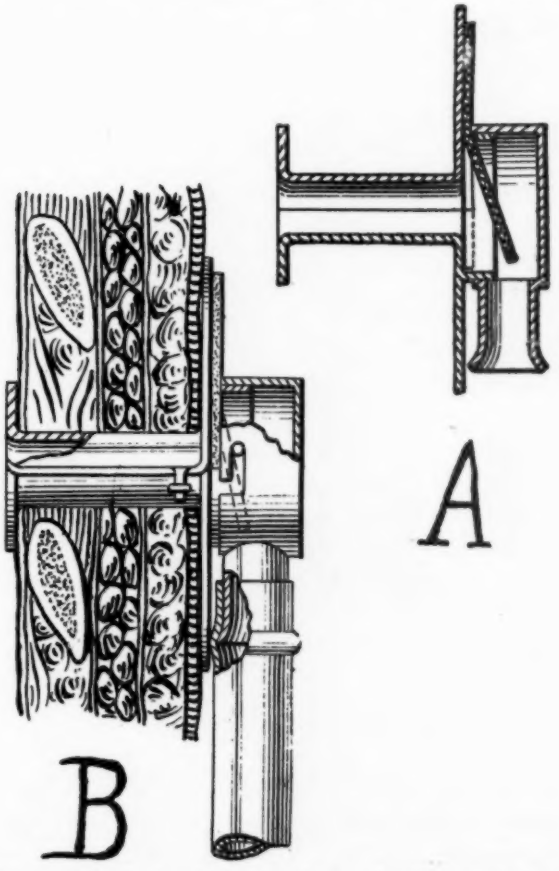

FIG. 4. Schematic view of action and relation of cannula in situ. A, action of the valve, which opens and closes automatically, at each respiration. B, relation of cannula to pleural cavity and chest wall, showing how chest wall is completely closed around cannula and pus is carried out of pleural cavity through cannula and rubber tube.

around the long flange of the cannula some gauze saturated with thick zinc oxide ointment made with 30 per cent lanoline, so as to make the cannula fit snugly and become airtight, or, use, for the same purpose, gauze impregnated with collodion. The line of incision and the

cannula can be sealed with collodion to make the whole airtight. Put over the site of operation a thick dressing, attach a bottle to the rubber tube and secure the bottle in such a way that pus can drain into it, i.e. to the patient's bed, or, when he gets up and about, suspended from his waist.

Postoperative Care. The patient is to sit up in bed or walk about as early as his condition allows. Many patients have been out of bed the day following the operation.

The postoperative care of patients treated according to instructions given above is very easy. Indeed, there is practically no postoperative care: no dressing, no drainage tubes to be changed, no toilet of the skin, no lavage of the pleural cavity, no special position to be given to the patient, no painful medication of any kind. In fact, the only care required is the emptying and cleansing of the bottle that collects the pus. The patient is never disturbed for any reason for several days and generally not until the cannula is removed.

When to Remove the Cannula. The time for the removal of the cannula depends on the condition of each individual patient. As a general rule, we can say that the cannula has to be removed when the lung has expanded and the pleural cavity ceases to secrete pus. This generally occurs between six and twelve days after the operation. Roentgenograms are very valuable in establishing the condition of the lung and pleura and should never be omitted, when they are available. When the cannula is removed one problem concerns the surgeon: will the wound close too soon and pus collect again in the pleural cavity? My experience has been that when the lung is well expanded and no appreciable amount of pus comes out through the cannula, the cannula can be removed and the wound allowed to heal. However, a smaller or larger space is always present between the visceral and parietal pleura.

Fig. 5. Manner of applying the cannula. The lower half is introduced first by holding the long flange, while the short flange turns around the rib and enters the pleural cavity.

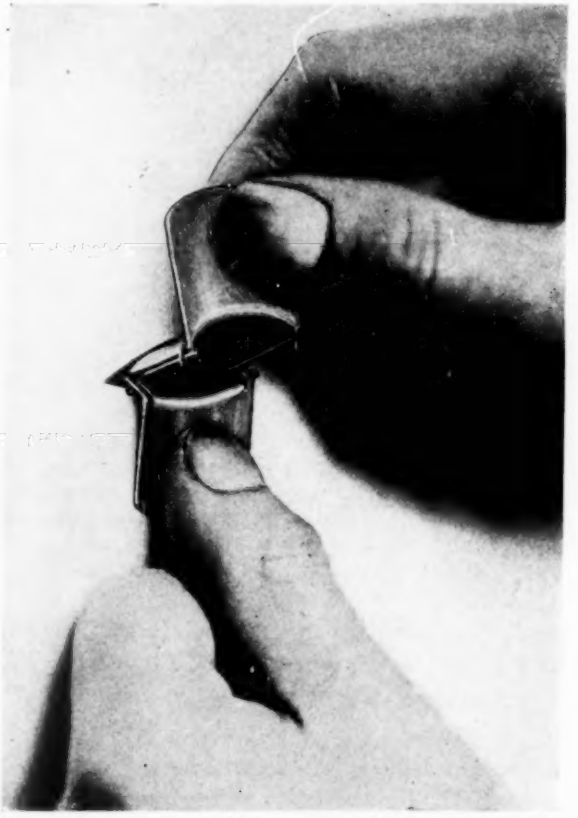

Fig. 6. The upper half is applied by introducing its ridges in the grooves of the lower half and making the short flange turn around the rib.

In order to secure a complete cure I introduce into this space from ten to thirty c.c. of a stimulating paste,* and repeat the injection later if necessary. *Do not introduce drains of any kind.*

Removal of the Cannula. In order to remove the cannula, the process of introduction is reversed. That is, the upper valve is removed first, the lower will then practically fall out of itself. In order to facilitate the removal of the upper valve it should be grasped with an artery forceps rather than with the thumb and index finger.

Points to Be Emphasized. The *small amount of pus draining through cannula.* On the second or third day only a few drops of pus drain out. Do not think that the cannula does not functionate; *there is no more pus to drain.* Only exceptionally is the cannula occluded. We have noted only one case in which zinc oxide ointment filled the cannula. In this case an intern, without knowing how the cannula was made or functionated, removed the dressing the day after the operation and smeared zinc oxide ointment all around the wound, and filled the cannula with it. The damage was easily repaired by cleaning the cannula and putting in a new rubber valve.

Rubber Valve. Sterilize the rubber valve by placing it in tincture of iodine a few minutes; boiling may soften the rubber.

Pulling on the Cannula. See that the rubber tubing and the dressing do not pull on the cannula. Pulling is easily prevented, by strips of adhesive plaster passed like straps over the shoulder, holding up dressing and tubing.

Size of Cannula. Only one size cannula is made. It can be used in children (smallest child treated three months old) as well as in adults. In children, when a rib is resected, cure is so rapid that osteomyelitis has never been observed. (There were 18 cases in which ribs were resected.) As the thickness of the thoracic wall varies, it would be impossible to have cannulas that fit each case snugly. However, it is extremely easy to make the cannula fit as snugly in a baby as in an adult with thick thoracic wall: The cannula is placed in the thoracic cavity; the deep and skin sutures are tied, as explained above; the two external flanges are pulled outward and the space left between the valve and the skin is filled with gauze impregnated with the ointment already described or with plain petrolatum, or with long strips of gauze wound around the cannula.

*Cocoa butter 40, lanolin 40, almond oil 20, odine 25, naphthol 3, camphor 3, creosote 8, guaiacol 6.

FIG. 7. The two halves are put together by introducing the points of the upper half in the eyelets of the lower.

Dressings. If the cannula has been well surrounded by gauze impregnated with zinc oxide ointment, or collodion, and the sutures have been properly applied and tied, the dressing remains clean.

POINTS OF SUPERIORITY OF AUTHOR'S CANNULA OVER OTHER MEANS EMPLOYED AT PRESENT

1. Operation can be performed in all cases under local anesthesia, thus avoiding the dangers inherent to general anesthesia.

2. Osteomyelitis of the ribs and deformities of the thorax have never occurred: this was due probably to the facts that the cannula is left in situ a very short time and the patient's recovery is rapid.

3. Mortality is a rare occurrence. There was no death in 18 children and about 200 adults, treated by the author and other surgeons.

4. Complete cure is more rapid and is obtained in more cases than with any other method.

5. The patient is comfortable immediately after the operation and is never disturbed, made uncomfortable or actually hurt, as happens with any other method of treatment.

6. It makes the treatment of empyema thoracis as clean as a wound healing by first intention. Disgusting pus-saturated dressings, are completely eliminated.

7. It is the only method that favors distention of the lung, with the most perfect simultaneous, continuous drainage of the pus.

8. All the complications so common with other methods—chronic empyema, fistulas, dropping of drainage tubes in the pleural cavity, etc.—are completely eliminated.

9. The method of treatment is the cheapest. It does not require special dressings of any kind, or expensive apparatus that can get out of order. (Author's cannula is durable, will never get out of order, and is inexpensive.) This method of treating empyema can be applied by any intelligent practitioner under the most unfavorable circumstances, the patient needing practically no care or special assistance and the whole procedure being easily carried out anywhere. No special apparatus of any kind is required, except a scalpel, a syringe and some local anesthetic and the cannula, which can be easily sterilized in boiling water.

10. It is perhaps the only method by which double empyema can be safely operated upon.

11. The author's method, by not requiring any dressing, introduction of drains, instruments, etc., after the operation prevents secondary infection of the pleural cavity.

It is easily understood that a method that reduces the time of treatment to a few days will yield results far superior to any other method requiring much longer periods of dressing. Consequently, late results are most satisfactory. We have observed recurrence in one case out of eighteen children and two cases out of two hundred adults. The cases where recurrence was noted had a very unsatisfactory postoperative care, due especially to poor financial conditions.

In all cases in which rib resection has been necessary the bone reformed completely. In some cases it is impossible to state from roentgenograms that there had been a rib resection.

SPECIAL TECHNICAL POINTS

Line of Incision and Drainage. Perfect drainage is most essential in treating empyema and the lowest point reached by the pleura might seem to be the most logical point to be selected for the incision. The pleura lines organs that form an angle (the costodiaphragmatic). Incision made in the lowest portion would have to go through thick muscular and fatty tissues and would actually not drain the pus. In fact, after pus has been present in the pleural cavity for some time the two leaves of the pleura lining the costodiaphragmatic angle become adherent and the space between the two leaves is occluded either by adhesions or by fibrin deposited between them and there is danger of entering the peritoneal cavity. Moreover, even if pus should escape freely when the incision is made, there would be danger that the diaphragm might later block the opening made in the pleura, after the bulk of the pus is evacuated, because the diaphragm, which is low when the pleural cavity is full of pus, raises up immediately after the pus is evacuated and obviously would block the very low opening made in the pleura, and cause a new collection of pus in the pleural cavity.

Incision must be made where the tissues above the pleura are thin, where the intercostal space is wide, pus can be obtained

freely and there is no danger of entering the peritoneal cavity. The incision recommended answers all these desiderata.

Incision Close to the Lower Rib. The incision must be made close to the upper edge of the lower rib in order to avoid injuring the blood vessels situated just below the lower edge of the upper rib. Remember that hemorrhage from the intercostal vessels is very difficult to control and might be fatal, because the blood vessels can bleed freely into the pleural cavity.

Incision of the Pleura During Inspiration. The incision of the pleura should be made when the diaphragm is lower, that is during inspiration.

Adhesions Should Not Be Broken. Certain authors have recommended the breaking of all adhesions. Nothing is more dangerous than breaking the adhesions found in the pleural cavity. Breaking of adhesions opens numerous channels through which infection can be diffused. It will often cause a pulmonary fistula by tearing also some lung substance adherent to the adhesions. It makes complete *restitutio ad integrum* impossible because, in breaking the adhesions, the epithelial lining is violently torn and must be replaced by connecting tissue. Breaking of adhesions, therefore, is dangerous to life and prevents rapid and complete recovery. By using my cannula all adhesions break spontaneously and are reabsorbed, because the vacuum created in the pleural cavity actually forces the pus to break through any pocket in which it might have collected and compels the expanding lung to take its place. It is easily understood that even when the pus is sacculated and the cannula is applied to the pleural cavity in a dependent position, the emptying of the lower pocket creating a vacuum and compelling the lung to expand, causes the breaking down of the adhesions that separate the different pockets and drains out all the pus contained in the pleural cavity. There was a striking illustration of this in a case in which clinically the pus appeared to be abundant and after opening the pleural cavity only a comparatively small quantity was obtained. In the afternoon the patient had a sudden strange sensation in his chest and dyspnea; pus filled rapidly a six ounce bottle connected with the cannula and overflowed. As an *x*-ray examination of the patient had not been made we can only surmise that we had to deal with a case of sacculated empyema, a large pocket of pus breaking a few hours after the pleural cavity had been opened. Recovery was complete in twelve days.

SOME FACIAL DISFIGUREMENTS*

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ONE faces a discussion of the question of the possible removal of facial disfigurements with some hesitation, owing to the danger of one's efforts being misinterpreted, since there is so much quackery rampant in this line of therapy. There is opportunity for legitimate practice in this field, however, particularly when one considers how much benefit can be afforded in educating the ignorant public as to the limits of therapy; yet one becomes discouraged, after warning a patient against the dangers of some quack panacea, by seeing her put herself in the hands of some plausible charlatan, often with the direst results.

The family doctor makes a mistake when he treats lightly a patient who comes to him to have some blemish removed from the face, for the patient may be worried about its presence and she is sure to seek someone who will at least make an attempt, even though abortive, to rectify the disfigurement; and it is surprising how much can be done for many of these deformities.

In the first place, let us mention what should not be attempted by anyone:

1. *Paraffin injections to fill up cavities.* I have seen some terrible results follow these injections. They may suppurate, resulting in very disfiguring scars; they usually become firm, fibrous nodules felt under the skin as shot. Injections into the nose have resulted in blindness from emboli. The paraffin does not remain a fluid mass but after a time becomes surrounded and intermeshed by fibrous tissue which may contract, drawing in the skin, resulting in irregular and rough depressions, and the end-result may be infinitely worse than the condition before the procedure.

2. *Face lifting.* This is usually ineffectually done by quacks, by removing an ellipse of skin, in the hair line above the ear, and suturing the edges. This lifting lasts for a few months only when the face sags as before from stretching. A permanent lifting can be done thus: After removing an ellipse above the ear and tunnelling down the cheek towards the mouth (Sheehan), a piece of fascia lata, excised from the thigh, is passed from above down the tunnel and its lower end, divided into three longitudinal tails, is sutured to the drawn-up muscles about the mouth by subcutaneously passed fine silk sutures. This method of lifting the face is permanent, provided there be no infection of the tract but the possibility of sepsis renders this method very questionable.

3. *Removal of superfluous hair on the face with x-rays* is done by the quacks. It is attended with great danger to the patient, for to permanently kill the hair follicles, an overdose must be given, which also kills the sebaceous and sweat glands, resulting in scaliness, telangiectasia, and finally atrophy of the skin, to say nothing of the danger of a burn resulting. *The Delineator* asked the New York Skin and Cancer Hospital dermatologists for an authoritative pronouncement upon the value of the method, explaining that they had had many inquiries regarding its value and they had already collected the opinions of more than a dozen specialists, who had all condemned the *x*-ray method of treatment. The Skin and Cancer Hospital replied as follows: "The use of the *x*-rays to remove superfluous hair is extremely dangerous. Their use exposes the patient to great risks which are, atrophy of the skin (from killing of the glands), brownish discolorations, new blood vessel formations, and the development of keratoses, or warty-like growths, which frequently undergo malignant degenerations."

* Read before the Hospital Graduates Club, April, 1926.

Certainly superfluous hair is a great disfigurement and everything possible ought to be done to relieve it. Chemical depilatories are effectual and are much used by women in the axillae. Their continued use, however, sooner or later results in a dermatitis. The safety razor is the best instrument to remove hair in the axillae. Of course, chemical depilatories can not kill the follicles, so that any effect from the applications are but temporary. On the face, depilatories cause roughness and redness and irritations. The only sure cure is the killing of the follicles by electrolysis, a long, trying, painful procedure to remove each individual hair. To make hair inconspicuous it is only necessary to lighten it in color. This can be done by applying violet ammonia water to remove the grease, and then peroxide of hydrogen to bleach the hairs.

Beauty parlors and quacks claim that they remove the so-called *liver spots* from the face and they thus mulct women of large amounts of money. "Liver spots" are simply large freckles, more deeply pigmented. By applying irritants, a certain depth of the surface of the skin scales off and with it some of the pigment. There may be some slight temporary improvement, but soon, when the skin has reformed, the discoloration is as bad as ever. *Moles* are of two sorts, pigmented and unpigmented. The unpigmented mole is removed without difficulty by the high frequency current. But it is another matter to interfere with the pigmented mole for fear of actively starting it into the malignant melanoma. The lower down on the body the pigmented mole is situated, the greater its potentiality for malignant development. On the face, the danger in destroying it with the high frequency current is small.

Hairy nevi are best treated by first epilating the individual hairs by electrolysis. Then the nevus angioma can be removed with the high frequency current.

Polyps and *warts* are easily removed by the high frequency current or cautery, and, if there is any suspicion of malignancy of the bases, a wide area of the base should be treated with the high frequency current, this to be followed by treatment with radium. If, notwithstanding, the ulceration spreads the only resource is wide surgical excision and skin grafting. We are then dealing with a rodent ulcer. *Keloids* are best treated by radium, less successfully by roentgen rays. Surgery is contraindicated in keloids as the resultant scar will become more keloidal than before.

Nose deformities resulting from either injury or disease are usually easily remedied. Twisted noses are molded into shape by the insertion of a chisel through the lifted columella and fracturing the nasal bones. Humped noses are treated by chiselling away the hump through the same incision.

A distressing disfigurement, resulting from syphilis or from injury, is the saddle nose, one with a depressed center. The deformity is easily overcome by filling out the depression by inserting a piece of rib cartilage, through a small incision in the columella through which a tunnel is made up the front of the nose, into which the cartilage is inserted. This is a very successful and gratifying surgical procedure.

There are certain pre-cancerous lesions which should be removed before they develop into cancer. One is *leucoplakia of the tongue.* These are smooth, white patches usually situated on the upper surface of the anterior half of the tongue, rarely extending to the edges. By some, it is regarded as a chronic superficial inflammation, by others, as a degeneration indicating tissue senescence. It almost always appears only in men after 40, and the most marked examples of the disease are seen in the syphilitic whose tongue is subjected to constant irritation by alcohol and tobacco. Later the hardening plaques become fissured, and ulcerate or develop a wart. The degeneration of these fissures and warty growths into carcinoma is very frequent.

Treatment consists first in removing all sources of irritation, smoking and chewing should be stopped and all carious dental stumps should be removed. The patches should be removed with a knife, under local anesthesia. Caustics should never be used as they only increase the irritation. A Wassermann test should first be made, however, and antiluetic treatment given if the reaction is positive.

If there be decided ulceration in the patch, the specimen, after its removal, should be subjected to a careful microscopical examination. If cancer be found, it calls for a second, more radical, and wide excision of the whole thickness of a portion of the tongue with removal of the possibly affected cervical nodes.

The same considerations apply to *keratoses of the lip*, or wartlike outgrowths, which occur in smokers. Removal with the knife and microscopical examination are safest.

Rodent or Basal Celled Ulcers. This apparently benign, slowly advancing lesion may become very serious and should not be made light of. For practical purposes, skin cancers are of three types. 1. Basal celled—only locally malignant, never metastasizing to neighboring nodes. 2. Squamous celled—malignant, metastasizing to nodes, causing death fairly rapidly. 3. Nevoid or melanotic—exceedingly malignant, killing with distant metastases.

The basal celled cancers (rodent ulcers) today are considered to arise in the basal layers of the skin, in fetal rests under the skin, or in the hair follicles, sweat or sebaceous gland structures. They very rarely arise in normal skin, but usually in some precancerous dermatosis, most frequently seborrheic warts. A fact of considerable surgical importance is that the growth under the skin is much more extensive than the surface appearance indicates. No one has as yet produced a rodent ulcer experimentally. *X*-ray burns are never basal celled cancers, but always the malignant squamous celled cancers. Rodent ulcers usually occur after the age of fifty, and blondes are especially liable to them. They occur *above* the line of the lips, most frequently about the nose and around the eyelids. About the temporal regions and ears, chronic ulcerations may be either basal celled or squamous celled. Hence the desirability of a pathological examination of the tissues of these so-situated lesions, because, if the ulceration be found to be squamous celled cancer, in addition to a wide local excision, there is requisite a removal of the draining lymphatic nodes. Perhaps if we picture the only adequate treatment in a patient with cancer of the breast, we may get an idea of the proper procedure in all squamous celled cancers anywhere. In cancers of the breast, the axillary nodes are always removed, and anything short of this is futile. In cancers of the larynx, the draining cervical lymph nodes should be removed at the same time that the larynx is removed. In the same way, the lymph nodes of the neck should always be excised in association with the local excision of squamous celled cancers of the lips and tongue.

Several methods of treatment of rodent ulcers have been used, and the choice is a matter of great discussion. These methods are: 1. Caustics, such as arsenic and chloride of zinc and carbon dioxide snow. This method of treatment is absolutely to be discarded as being very uncertain in the extent of the destruction of the malignant tissue. Carbon dioxide snow causes a very disfiguring, dead white scar.

2. The high frequency current, producing electric dessication with the monopolar current and electric coagulation with the bipolar current. This is a very effective method provided it is carried wide enough. It actually destroys the tissue. The objection is the expense of the instrument required. In the neighborhood of the eye the high frequency current should be used with great care as accidental sparking on the globe of the eye may be followed by disastrous results.

3. The actual cautery. This also is a very good method of removal.

4. The *x*-rays and radium are probably the most widely used methods of treatment. The duration of the lesion makes a great deal of difference in the curability with the *x*-rays and radium. Hazen, in the *Journal of Cancer Research*, found that in patients with growths present less than one year, there was only 5 per cent. of failures with *x*-rays and radium, whereas when the lesions were present 4 years or more, the failures were 34 per cent. Basal celled cancers in the ear cartilages, eyelids, in scar tissue and around the lips, do poorly with *x*-rays and radium (Hazen). Brain and Massie (*Guy's Hospital eports*, Vol. LXXIV, 1924, p. 235) clearly show that the greater number of cases are cured within the first six months after the commencement of treatment. At the end of twelve months the chances of cure become very slight indeed. They maintain that it is not wise to delay excision for more than six months after the commencement of radium treatment for they show that after this period the chances of a permanent cure gradually decline.

5. The most successful method is wide surgical excision (immediately preceded by cauterization of the ulcer with the actual cautery to prevent dissemination of the cancer cells on the fresh operative wound) to be followed by free, full-thickness skin grafts to close the defect.

If after one or two radium treatments there is not a rapid improvement of the ulceration, these treatments should not be persisted in, but surgical excision should be resorted to, as this is our last bulwark against the invader. When the ulceration has become large, wide and deep, only radical surgery is effectual, sometimes producing hideous deformities, as a result of necessary resections of the superior maxilla, and nose, and even requiring, at times, enucleation of the orbit. These defects must then be filled with pedicled flaps. In treating rodent ulcers, the surgeon must go hand in hand with the radium expert. It is still a matter of discussion whether *x*-rays or radium actually kill the cancer cells or whether the rays increase the resistance of the surrounding tissues to invasion by the growth. Swenstrom (*Journal of Cancer Research*, Vol. IX, No. 2, June, 1925) in a review of the theories of the mechanism of action of radium says that the result of radiation is due to a combination of several actions: 1. Direct action on some of the cancer cells. 2. Disturbance of vascular supply. 3. Increasing activity of surrounding tissues. 4. Action of organic products from the radiation. 5. Interference with colloid systems. 6. Disturbance of osmosis through cell membranes. 7. Disturbance of salt metabolism. 8. Changes in the blood. He says the action is not, as has been stated, a pure cauterization nor is it a pure effect of nonspecific immunization.

By surgery, on the other hand, we expect to get wide of the diseased tissue, into healthy tissue, thus removing all the diseased cells. If one cannot get into healthy tissue, it is no use operating, in fact it is detrimental, for the ulceration seems to be accelerated in its growth by half-way surgery.

If bone, or cartilage, is involved in the growth, radium is useless. Radical surgical excision alone is then indicated.

It would seem then safe to make the statement that if the ulceration has not existed for over a year and is of moderate size, the high frequency current, the actual cautery, and radium applications are effective methods of treating basal celled, rodent ulcers, provided that bone or cartilage is not involved. When, however, the ulceration is large and of long duration, and when bone or cartilage is involved, the most effective method of treatment is wide surgical excision, followed by some type of skin grafting to cover the resulting deformity.

Most recurrences after radiation occur between six months and one year after treatment. If the year elapses without recurrence, a permanent cure is probable. After radiation, Mackee reports 15 per cent. recurrences in 201 patients, and Hazen 7 per cent. in 147 cases. Bloodgood reports 93 per cent. of cures after surgical excision.

FRACTURES OF THE HUMERUS

A STUDY OF 53 CASES*

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IN the treatment of fractures of the humerus, the closed method usually suffices. Only when all closed manipulations meet with failure should we consider open operation. Dowden[5] of Edinburgh correctly expressed current surgical opinion with respect to fractures of the arm bone when he stated that he had obtained good results by reducing fractures as well as possible without operation, that perfect anatomical adjustment of the fragments is not necessary, and that early active and passive motion of the extremity is very important.

The present study is a review of all the cases of fracture of the humerus admitted to St. John's Long Island City Hospital from January 1924 to May 1926. Fifty-three cases were collected and carefully studied. All were treated by the closed method. Even though the number of cases reviewed is small, nevertheless many important conclusions can be stated as to pathology and methods of treatment. For convenience of study, the cases are divided into three groups: fractures of the upper end; fractures of the shaft; fractures of the lower end.

FRACTURES OF THE UPPER END

The most common site for fracture in this region (and thereby justifying the name) is the *surgical neck of the humerus*. In our series of 13 fractures of the upper end, 10 (77 %) fell into this group. Anatomically, this can be explained by the fact that the surgical neck is the most constricted portion of the bone, is free of all muscular and tendinous support, and is the end of a long lever.[12] A longitudinal section of the humerus shows a considerable quantity of cancellous tissue, the absorption of which in persons of advanced years leaves the bone weak at this point.[8] However, two patients in our series were 10 and 14 years of age, respectively. But the remainder (80%) were between the ages of 35 and 60.

The displacement usually consists of the tilting upward and laterally of the proximal fragment, because of the muscles attached to the greater tuberosity: supraspinatus, infraspinatus, and teres minor.[3] Rotation of the proximal fragment, so often mentioned by some authors, is not very common, since lateral rotation is equalized by the internal rotating action of the subscapularis muscle attached to the lesser tuberosity.

For fractures without much displacement, a "V" pad made of cardboard placed between the arm and the chest wall, and a Velpeau bandage or posterior molded splint to support the extremity, may be sufficient. However, if marked displacement be present, more active measures should be instituted. Proper alignment of the fragments can be obtained only by marked abduction, to bring the distal fragment in a line with the upwardly tilted proximal fragment. (Figure 1.) We find that the most effective apparatus for this is the Thomas arm splint suspended in the Balkan frame, as advocated by Blake and Bulkley. In this manner we can provide traction and countertraction, in the fully abducted position; immobilize the fracture site; treat any wounds that may exist; flex the forearm upon the arm and prevent elbow stiffness; and afford comfort and freedom of movement to the patient. Ether anesthesia is a valuable aid to proper reduction, and a 10 pound weight is sufficient to maintain traction. Five out of 10

* From the surgical service of St. John's Long Island City Hospital, Drs. Frederick C. Keller and Robert E. Brennan, Attending Surgeons.

patients with fractures of the surgical neck of the humerus (50%) required the above treatment, with good end-results. This method should be reserved only for the more difficult cases, inasmuch as the patient must of necessity be confined to bed.

Epiphyseal separation at the upper end is rare, because of the conical shape of the diaphysis and the cup-shaped surface of the epiphysis. No case was recorded in our series.

FIG. 1. Case 1215G. M. G. Fracture of the surgical neck of the humerus. Left—Before reduction. Right—Position corrected by abduction, traction and suspension in Thomas splint and Balkan frame.

Fractures of the anatomical neck are much less common than is supposed. Santee[9] in a review of 170 fractures of the humerus, reports only 4 cases of anatomical neck fracture. Our 2 cases occurred in a female 30 years of age and a boy 10 years of age, although it is most common in old age. Reduction under anesthesia, a posterior molded splint with a shoulder cap and a V pad in the axilla, resulted in good alignment in both cases. This type of fracture is usually accompanied by impaction. (Figure 2.) If impaction does not occur, and the capsule of the joint is torn through its entire circumference, necrosis of the upper fragment must follow. Usually, through the untorn periosteum, and through portions of the capsule reflected from the inner side of the shaft below the anatomical neck to the edge of the articular cartilage on the head, the blood supply is maintained. Thus necrosis is prevented and union results. There is no direct blood supply to the head of the humerus corresponding to that received by the femoral head through the ligamentum teres. Early massage and active mobilization are necessary to maintain the function of the shoulder joint. One need not fear separation of the fragments.

Fracture of the greater tuberosity occurs usually in men, and is caused by a direct fall on the shoulder, or severe muscular action. Marked displacement is rare. External rotation is lost, and internal rotation is increased. The position for treatment is abduction and external rotation, to relax the muscles attached to the

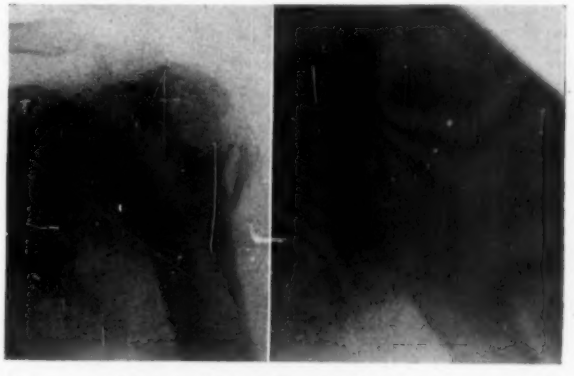

FIG. 2. Case 3590F. N.T. Fracture of anatomical neck of humerus. Left—Before reduction. Right—Reduction under anesthesia; axillary V pad and posterior molded splint.

greater tuberosity. The single case in our series presented no displacement, and it was satisfactorily treated by a Velpeau bandage. The cause of the injury was a sudden severe tug at the arm by a rope attached to a crane.

FRACTURES OF THE SHAFT

This type of fracture is quite frequently seen, and is one of the easiest to diagnose clinically. It is especially common from falls from great heights, and among the victims of vehicular accidents. Of the 18 (34%) cases of shaft fracture, 8 (44%) were caused by automobile or motorcycle accidents; 6 (33⅓%) fell down one flight of stairs, or from a height of at least one story. Piersol[8] states that "the middle of the shaft is the smallest, hardest, and least elastic portion of the shaft, and therefore the region most frequently broken." Our figures substantiate this, in that 12 (66%) of our 18 shaft

fractures occurred in the middle third, 2 (11%) in the upper third, and 4 (22%) in the lower third of the shaft.

The displacement in this type of fracture is determined more by the force and direction of the blow, than by muscular action. However, the deltoid muscle may influence displacement, but this is not constant, and easy to correct (Figure 3). In all cases of complete fracture, there is a tendency to overriding of the fragment and shortening. This is the result of muscular contraction, but it is never extreme as in femur fractures, rarely exceeding 1.25–2.5 cm.[12]

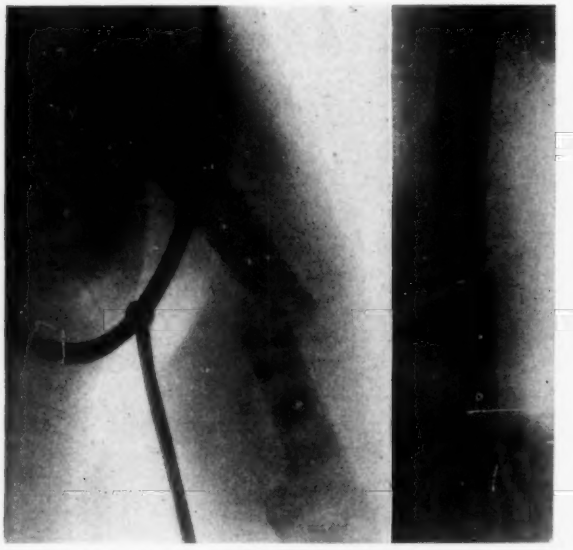

Fig. 3. Case 696H. J. S. Fracture of shaft of femur. Left—Showing ineffectiveness of Jones humerus splint, especially when deltoid abducts upper fragment. Right—Corrected by triangle splint.

In the treatment of shaft fractures without much displacement, a retention support, such as a posterior molded splint (with or without a coaptation arm piece) and a V pad in the axilla, usually suffices. However, where marked displacement exists, the object of the treatment is to overcome muscular spasm, and correct overriding by continuous traction. The amount of any traction should be gauged by the *x*-ray. Of the various splints used, the Jones humerus traction splint has the advantages that it is light, does not enclose the chest, provides traction and countertraction, and permits of easy examination and treatment. However, abduction is not easily obtained. In severe compound fractures of the shaft, traction and countertraction with suspension in the Balkan frame is the method of choice. Three of our 18 patients with shaft fractures received good results when so treated.

As regards triangular splints, we find that the Osgood-Penhallow[7] and the Mitteldorpp triangles will maintain well aligned fragments satisfactorily, but contribute nothing or very little toward producing traction and overcoming muscular spasm. The right angle triangle splint that we use on almost all fractures of the shaft, is made in the following manner: Using the sound extremity for measurements, ordinary basswood splint material is fashioned into a triangle, to be held together by a backing of adhesive of similar width. For each of the sides of the triangle (the chest, arm, and forearm piece) two thicknesses of basswood are cut to length. The three surfaces with which the soft parts come into contact,

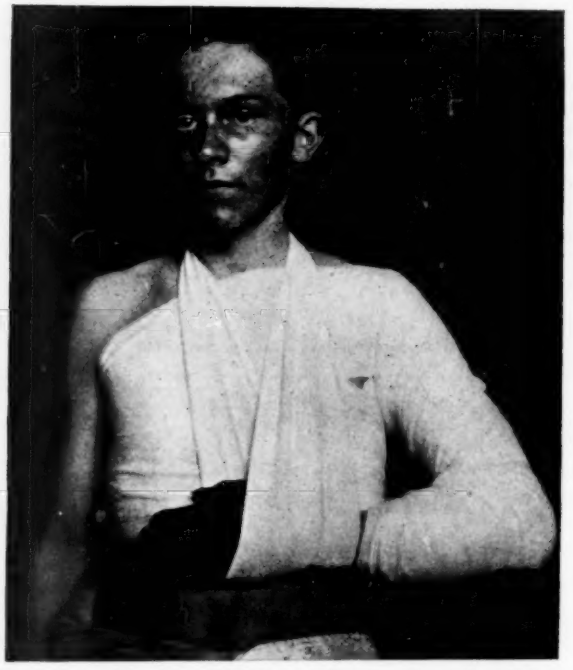

Fig. 4. Application of right angle triangle splint. Note that traction upon the humerus may be obtained to a great degree by diminishing the elbow angle, and slightly increasing the length of the arm piece. A sling made of flannel supports the hand.

are covered with an abundant layer of cotton tightly bandaged to all the three flat sides of the splint. The sharp angles that fit into axilla and elbow, may be reinforced with small combination pads. The triangle splint is now ready for application to the fractured part, and the vertical side is attached by a wide strip of adhesive to the chest, but not completely encircling it. The arm and forearm are strapped to their respective portions of the splint, and the whole extremity is now covered by a flannel bandage running from the wrist to the shoulder, where a spica completes the dressing (Figure 4). A coaptation splint over the fractured area may prove a valuable adjunct. In our experience, the most important step in the procedure is to place the forearm in as near a right angle with the vertical chest piece as possible, for only in this way can almost unlimited traction on the arm be obtained. One must be careful to secure the proper amount of traction with not too much pressure, however, in the axilla and at the elbow. Therefore, the length of the humerus piece is a vital factor in the treatment, and many times will determine success or failure. General anesthesia may be necessary to provide the initial reduction.

By this method, abduction to a marked degree may be realized, a most valuable position, especially when the deltoid muscle is a factor in abducting the proximal fragment. The patients are comfortable and need not be confined to bed. Daily inspection of the immobilized limb is essential. Loosened parts are reinforced, while adjustments may be necessary to alter the amount of traction, and the degree of pressure effected by the coaptation splint. After two and one-half to three weeks, the triangle splint is removed, and a posterior molded splint is applied. Two of our patients originally immobilized in the Jones humerus splint, required a second reduction because of the poor position of the fragments; application of triangle splints showed a much better alignment. (Figures 3 and 5.) Fifteen (83%) of our shaft cases were immobilized by right angle triangle splints.

Delayed union and non-union occur more often in the shaft of the humerus than any other long bone. Wilson and Cochrane[12] attribute this to the fact that the nutrient artery enters the shaft at its

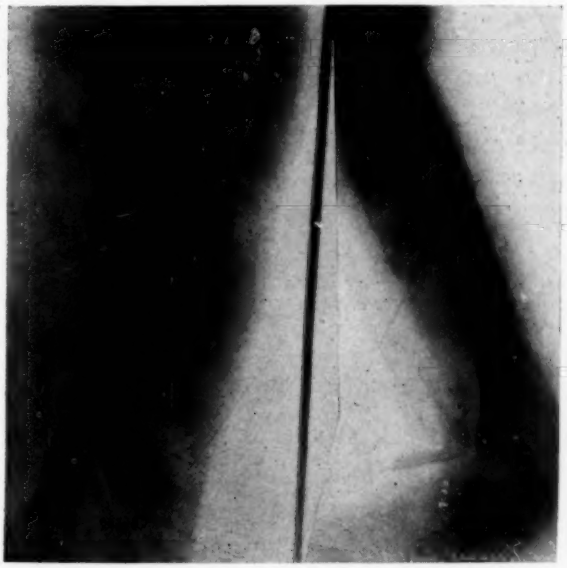

FIG. 5. Case 2258F. C. W. Fracture of shaft of humerus. Left—Jones splint: overriding and angulation. Right—Triangle applied: good alignment.

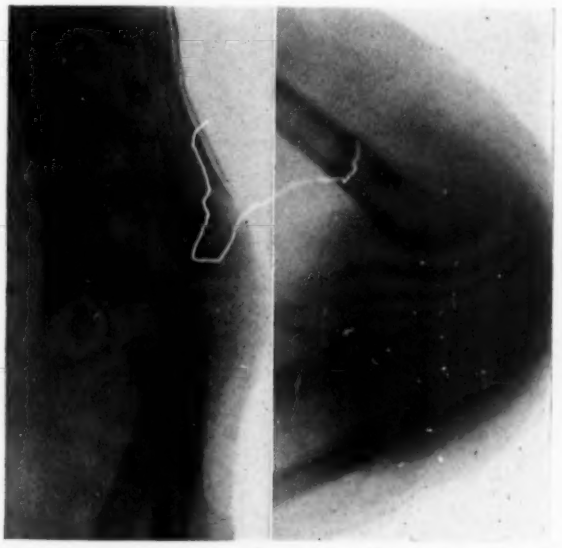

FIG. 6. Case 1131G. L. T. Supracondylar fracture, before and after reduction and immobilization in acute flexion.

middle, and its injury results in impairment of the blood supply. Piersol differs with this view and believes that the entanglement of muscular and tendinous fibers of the brachialis anticus and triceps between the bony fragments, is the real cause.

All our fracture cases are inspected daily, and at intervals splints are removed and the soft parts massaged. We believe this helps to prevent non-union not only by improving the circulation in the limb but also by avoiding pressure injury to the soft parts and atrophy to the muscles; and, too, it gives an opportunity for early passive motion in the joints.

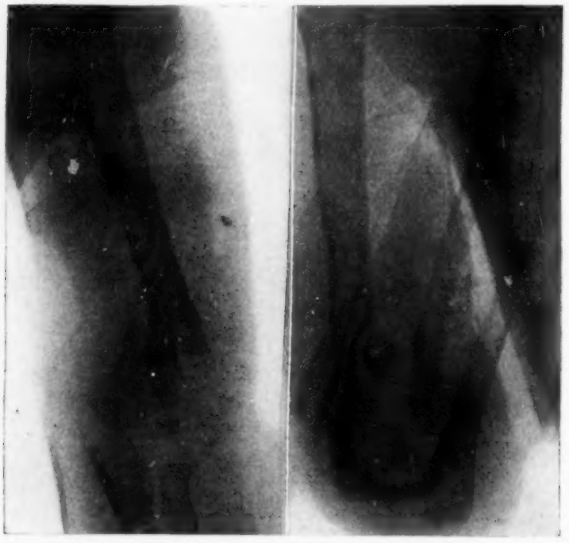

Fig. 7. Case 1365G. M. C. Diacondylar fracture, before and after reduction and immobilization in acute flexion.

Radial Nerve Injury. No examination of a fractured humerus is complete without ascertaining whether nerve involvement is present. The radial nerve may be injured at the time of the accident, or later when involved in the callus. Before the nerve enters the groove, it gives off three branches supplying the upper arm. These branches run in the muscular tissue and preserve their function in the large majority of traumatic paralyses of the radial nerve. The symptoms are largely motor, resulting in the well known wrist-drop. The sensory symptoms have no relation to the motor loss. The chief sensory loss is on the dorsum of the hand between the metacarpal bones of the thumb and forefinger, the so-called *punctum maximum* of anesthesia.

For treatment, a cock-up wrist splint should be utilized to prevent the paralyzed muscles from overstretching. Nutrition is maintained and degeneration is prevented by massage, baking, and electrical stimulation. Radial nerve paralysis occurs in 4 to 8% of all humerus fractures. Our patient, Mrs. Mc. V. showed a complete radial nerve paralysis resulting from the time of the accident without any improvement, and when bony union is firm, operation will be performed. The severity of the fracture in this case indicates that we probably are dealing with a severed nerve. In all cases, if signs of returning function do not appear in two months, the nerve should be exposed, sutured if severed, and freed if imprisoned in scar tissue and callus.

FRACTURES OF THE LOWER END

The lower end of the humerus is the region most frequently broken. Twenty-two (41.5%) of the 53 humerus fractures in our series were of the lower end. This is accounted for by the large number of fossae at the lower end which tend to weaken the bony structure. Most cases are in children. In our series, 19 (86%) occurred in children under 11 years of age. Sixteen (72%) gave a history of falling on the elbow, whereas in adults the force was an indirect blow received upon the outstretched hand.

1. *Supracondylar Fractures.* Rarely do we see the distal fragment displaced anteriorly because of two factors: The force of the fracturing blow, and the pull of the triceps muscle. Our series numbered four such fractures (8%). (Figure 1.)

2. *Transverse Diacondylar Fractures.* These comprised the greatest number: 9 cases (40%). The line of fracture traverses the thin layer of bone separating the olecranon and coronoid fossae, between the level of the supracondylar fractures and the epi-

physeal lines (Fig. 7). Inasmuch as the fracture region is always intra-articular, callus may encroach upon the olecranon and coronoid fossae, and so limit the range of motion at the elbow joint.

3. *Fractures of the External and Internal Condyle.* In falls upon the forearm and outstretched hand, since the ulna does not articulate with the hand, the force of the blow is transmitted through the radius upon the external condyle. This explains the infrequency of internal condyle fractures. Our series numbered only 1 case, as compared with 5 (22%) external condyle fractures. Displacement of an external condyle fracture is slight because of the dense triceps fascia covering it, and its connection with the ligaments of the elbow joint. If displacement is improperly reduced, there results an irregularity in the articular surface, a change in the joint axis with impairment of function, and an altering of the carrying angle.

4. *Intercondyloid Fractures.* These are the T- and Y-shaped fractures, by no means common in children. Two of our patients were ten years of age, and another 8 years. They are usually caused by great violence. Because of the extensive joint involvement, a guarded prognosis should be given always.

5. *Separation of the Lower Epiphysis.* The epiphysis unites with the diaphysis at 15 to 17 years of age. Separation usually occurs before the age of 12 or 13. Rarely is the whole epiphysis detached, the capitellar portion being the most frequently injured part. If there is no marked displacement, and the line of fracture extends through the epiphyseal line, roentgenography may not show the true condition, even though there is much swelling and great disability. Many such epiphyseal injuries are wrongly diagnosed as sprains and traumatic synovitis. One patient with external condyle fracture had a separation of the lower humeral epiphysis.

Inasmuch as all lower end fractures lie in close relationship with the elbow joint, and many of them are wholly or in part intra-articular, early and accurate reduction of the fragments, and early mobilization of the joint are necessary to restore perfect function.

After reduction, the universally recognized position for immobilization is acute flexion, first pointed out by H. L. Smith[11] and later popularized by Thomas, Jones, and Scudder.[10] Not only is the triceps muscle utilized as a splint, but also it is the position that provides greatest usefulness if full recovery is not obtained. Ether anesthesia is advantageous both when displacement exists, and when it is necessary to overcome muscular spasm for complete flexion. For fixation in the less severe types, we use Ashhurst's method of bandaging the forearm to the arm. In the more severe types, complete immobilization by a posterior molded splint is necessary. Motion is begun early, bearing in mind the severity of the fracture.

CONCLUSIONS

1. An analytical study is presented of 53 cases of fracture of the humerus.

2. The aim in treatment should be directed not so much toward perfect anatomical reposition of the fragments, as to union, return of function, and avoidance of deformity.

3. For severe upper end fractures with marked abduction of the proximal fragment, suspension in the Balkan frame with the use of traction and countertraction by a Thomas splint, was the method most successful in reestablishing alignment, treating coexisting wounds, and overcoming shortening.

4. In fractures of the shaft, a properly applied right angle triangle splint, as described above, yielded better results in our hands than any other method used.

5. In lower-third fractures, emphasis is placed upon careful reduction of fragments, immobilization in the acute flexion position, and early motion at the elbow joint. Of 22 lower-third fractures, more than a single reduction was necessary in 5 cases (22.7%).

REFERENCES

1. Ashhurst, A. P. C. Surgery, Its Principles and Practise, Lea & Febiger.
2. Campbell, W. C. Fractures of the Humerus. American Journal of Surgery, June, 1924, xxxviii, 140.
3. Cotton, Frederic. Dislocations and Joint Fractures, W. B. Saunders Co.
4. Cunningham. Text Book of Anatomy, Wm. Wood & Company, New York.
5. Dowden, J. W. *Glasgow Med. Journal*, 1923, xcix, 81.
6. Jones, R. *Clinical Journal*, October 26, 1904.
7. Osgood and Penhallow. *Jour. Amer. Med. Assoc.*, July 31,1909, liii, 375.
8. Piersol, G. A. Human Anatomy, Fifth edition, J. B. Lippincott Co.
9. Santee, H. E. Fractures of the Humerus. *N. Y. State Med. Jour.*, April 10, 1925, xxv, 606.
10. Scudder, C. L. The Treatment of Fractures, W. B. Saunders Co., 1923.
11. Smith, H. L. *Boston Med. and Surg. Jour.*, July 4, 1895.
11. Smith, H. L. *Boston Med. and Surg. Jour.*, July 4, 1895.
12. Wilson, P. D. and Cochrane, W. A. Fractures and Dislocations, J. B. Lippincott Co., 1925.

THE EARLY DIAGNOSIS OF CARCINOMA OF THE RECTUM AND PELVIC COLON

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AN early diagnosis of carcinoma in the terminal intestinal tract is of vital importance. In spite of the detailed descriptions in our standard text-books, and the numerous articles in the current medical periodicals, there still appears to be great difficulty in recognizing this condition in the early stages. A review of the literature reveals a lack of emphasis on the very early symptoms, while symptoms of the more advanced stages, where the disease has progressed to the degree of ulceration, are described at great length. The most important factor for the welfare of these patients is the diagnosis of their condition at the earliest possible date. Too frequently carcinomas in this vicinity are allowed to progress until they have reached the unfavorable stage, because of failure to recognize the first symptoms. In a review of three hundred cases, seen at the Memorial Hospital, ten and one-half months was the average lapse of time before a definite diagnosis was made.

ANATOMIC CONSIDERATIONS AND DIVISIONS

The location of these rectal and colonic tumors in relation to the anatomic variations of the bowel is such that they may be separated into four groups: 1. pelvic colon; 2. recto-sigmoidal juncture; 3. mid-rectum; 4. lower rectum, including the anal canal.

1. *The Pelvic Colon.* This section of the large bowel lying freely movable within the abdominal cavity, varies in length. It is covered by peritoneum and is attached to the posterior abdominal wall by the mesocolon; it receives its blood supply from the sigmoidal branches of the inferior mesenteric artery.

2. *The Recto-sigmoidal Juncture.* This area possesses a certain amount of mobility since it is partly covered by peritoneum. Its diameter varies in relation to the diameter of the rectum and the pelvic colon. Its blood supply is from the sigmoidal and the superior hemorrhoidal arteries.

3. *The Mid-rectum.* The rectum has a diameter larger than the pelvic colon and possesses a mobility that permits its functional dilatation and contraction. The nerve supply of the normal rectum provides for the sensation of dilatation; and traction in this area will produce pain. A sense of weight may be produced when the rectum is involved by a pathological process. The vascular supply is chiefly the hemorrhoidals and middle sacral arteries, with the greater part of the venous return through the inferior mesenteric vein into the portal system. In the female, the anterior rectal wall is in close proximity to the posterior wall of the vagina. In the male, the urethra, prostate, and seminal vesicles occupy a similar position.

4. *The Lower Rectum, Including the Anal Canal.* The anal canal is the terminal segment of the gastro-intestinal tract and is controlled by the external sphincter and some fibers of the levator ani. It possesses a liberal nerve supply which accounts for the acute sensation of pain when it is involved by pathological processes. The blood supply is mainly from the hemorrhoidal arteries, while the greater part of the lymphatic drainage is by way of the inguinal nodes.

In the opinion of various investigators, the lymphatic drainage of the lower bowel, shows considerable irregularity and variation. Clinically, the lymph node involvement most frequently developed with tumors of the different locations may

be summarized as follows: 1. pelvic colon tumors draining into the sigmoidal and colic glands; 2. recto-sigmoidal tumors, into rectal, sigmoidal and colic glands; 3. mid-rectal tumors draining into the rectal, sigmoidal and colic glands, and also into the sacral and iliac glands; 4. lower rectal and anal tumors draining early into the inguinal glands, and later into one or more of the above groups.

CONSIDERATIONS OF AGE AND SEX

Carcinoma of the rectum occurs in all classes and types of individuals. Family histories do not reveal sufficiently constant features to indicate that cancer in this location possesses any hereditary tendencies. Although onset may occur at any time after adolescence, over fifty per cent of these three hundred patients were between forty and sixty years of age. The average age in female patients was somewhat younger than in the male patients, but males are afflicted about twice as frequently as females, except between the ages of twenty and thirty.

Age	No. of Patients	Males	Females
10 to 20	2	1	1
20 to 30	16	6	10
30 to 40	26	16	10
40 to 50	57	31	26
50 to 60	101	63	38
60 to 70	73	55	18
70 to 80	24	20	4
80 to 90	1	1	0

GENERAL SYMPTOMATOLOGY

The symptoms of onset of these tumors show wide variation, and are often misinterpreted for months, both by the patient and by the physician. Such symptoms indicate some derangement of function of the alimentary canal, which may appear in the form of mild flatulence, or discomfort in the abdomen, accompanied by constipation or increased constipation. Again, the onset may be manifest by a lessening of the constipation; by an attack of diarrhea; by a few drops of blood accompanying the stool; or by pain with a feeling of distress in the anus. Loss of strength frequently precedes loss of weight, though neither of these may be considered early symptoms. Anemia, which is characteristic of early new growths of the proximal end of the colon is not an early symptom of cancer in its distal end or in the rectum.

Owing to the insidious onset, and the mildness of these early symptoms, one can scarcely overestimate the importance of obtaining a careful, detailed history in all obscure intestinal cases. The summation of these properly interpreted symptoms will indicate a condition of greater importance than mere indigestion, or an attack of hemorrhoids. Frequently a tentative diagnosis can be made from these early symptoms alone. The more pronounced symptoms appearing later, such as marked irregularity of the bowel movements, rectal discharge, hemorrhage, and pain, usually indicate, in the absence of other interpretation, cancer in this vicinity. Nevertheless, the variability of the group studied, extended over a period of from one to forty months before a definite diagnosis was made.

SPECIAL SYMPTOMATOLOGY IN RELATION TO ANATOMIC LOCATIONS

1. Pelvic colon carcinomas are usually slow growing with a tendency to circular infiltration of the bowel. This produces obstructive symptoms, varying to such a degree as to suggest two clinical types: (*a*) partial obstruction; (*b*) complete obstruction.

In type (*a*), onset is insidious. Constipation and flatulence, noted in practically all cases, are, at times, accompanied by attacks of acute, colicky, unlocalized abdominal pain occurring at irregular intervals, but often noted the day following the eating of a large meal of coarse food. These attacks tend to become more frequent, and more severe, until the patient is afraid to take large meals or to

induce active catharsis. Rectal irritability in the form of frequent passage of mucus, or attacks of diarrhea, usually accompanied by one of the above symptoms, may be the outstanding feature causing the patient to seek medical advice. As these partially obstructive symptoms progress, either complete obstruction occurs, or else diarrhea becomes a constant feature. In the later case, pieces of tumor tissue may be expelled, sufficiently large for pathological examination.

In type (*b*), symptoms are comparatively few, and differ from those detailed above by sudden complete stoppage of the bowels, without any previous history of constipation or flatulence. Flatulence and abdominal distress may be produced by purgatives and are not relieved by enemata. Patients often remain in this condition for several days, before a correct diagnosis is made or permission is obtained for surgical intervention. One patient, who later came under our observation, was without a bowel movement for fifteen days prior to laparotomy. Pain is not a constant early symptom of tumors in this location, but, in addition to the colicky type mentioned above, mild pain, or a feeling of discomfort may be present in the lower left abdomen and across the lumbar region.

2. Tumors of the recto-sigmoidal juncture naturally produce symptoms closely simulating those of the rectum or the pelvic colon, so that it is sometimes difficult to ascertain in which segment the tumor originated. Flatulence, constipation and frequent passages of mucus are quite characteristic of tumors of the upper segment, while in the lower segment, constipation without rectal irritability, is more common. Occasionally a feeling of weight in the pelvis is noted but pain does not occur until the later stages, unless there is pressure or infiltration of the lumbar or sacral nerves.

3. Mid-rectal tumors, which have a tendency to extend upward and downward, seldom invade the anal canal or encroach upon the upper limits of the rectum to the recto-sigmoidal sphincter. The mid-rectum is the commonest location for carcinoma of the terminal intestinal tract; sixty per cent of the tumors of this series were in this area. In these cases preliminary symptoms are few and are often overlooked until the condition is well advanced. The two cardinal early symptoms are constipation and the passage of small amounts of blood. Constipation may precede bleeding, or vice versa, but usually they are noticed about the same time and continue concurrently throughout the course. Flatulence and abdominal discomfort are usually absent or very mild until late in the disease, at which time the following annoying symptoms may be present: attacks of diarrhea; expulsion of foul-smelling gas; frequent and involuntary evacuations; and a feeling of weight or a dragging sensation in the pelvis. Pain, occurring comparatively late, may be localized in the anus, pelvis, bladder, across the lumbar spine, down the legs, and in the testicle.

4. In carcinoma of the lower rectum involving the anal canal, severe hemorrhage in the early stages occurs only very occasionally. The passage of small amounts of blood accompanied by pain and constipation is the early important symptom. This passage of blood, frequently preceding all other symptoms, is first noted as streaks on the stool or a staining of the toilet paper. Pain is felt when the tumor involves the anal canal and is more severe when the patient is at stool or in a sitting position. As the size of the growth and the ulceration increases, the above symptoms become more noticeable together with a persistent feeling that there is something remaining in the rectum, and a constant desire to evacuate the bowels.

DIAGNOSIS

Every patient seeking medical advice, although seemingly in good health, but presenting mild symptoms similar to the above, is entitled to careful consideration

and investigation. The abdominal examination frequently reveals but little, even when the tumor is situated above the recto-sigmoidal juncture, although occasionally pelvic colon tumors are palpable in the left lower quadrant. The later tumors may also produce distention of the colon and cecum, with sufficient tenderness on deep pressure over the cecum to suggest a chronic or subacute process. Whenever the abdominal examination fails to reveal sufficient findings to account for the symptoms, it is imperative that the rectum and pelvic colon be examined.

SPECIAL EXAMINATION OF THE RECTUM AND PELVIC COLON

1. Examination by palpation frequently reveals a tumor mass. Eighty per cent of the rectal cancers of this group were within reach of the index finger. Fat buttocks, narrow pelves, and an insufficiently long examining finger may account for the failure to reach the tumor mass, and must be taken into consideration. Palpation may be made more effective by having the patient bear down while in the Sims, or the squatting position. This examination is practically painless, except where there is an inflammatory condition in the anal canal, or when the canal is itself involved in the tumor mass. With females, a vaginal examination will determine the condition of the pelvic organs and the anterior rectal wall, and may, in addition, reveal a tumor of the pelvic colon lying in the pouch of Douglas.

2. Examination by inspection with proctoscope or sigmoidoscope requires an empty bowel. This can be obtained by a large dose of castor oil the day preceding. With the patient in the knee-chest position, direct vision may be obtained for a distance of 30 or 35 cm., by using a suitable electric speculum. If difficulty is encountered at the recto-sigmoidal sphincter, this may be overcome by inflating the bowel with air or waiting for the spasm of the sphincter to relax. This examination reveals the character of the tumor as to size, shape, injection, ulceration, etc.

3. Examination by roentgen ray is unnecessary with low lying tumors, but is very useful with those above the apex of the pelvic colon. In the early stages it is often necessary to use the bismuth meal in addition to the barium enema in order to demonstrate the "filling defect."

DIFFERENTIAL DIAGNOSIS

Four other conditions must be taken into consideration in differentiating cancers of the terminal intestinal tract.

1. Diverticulitis of the pelvic colon. This condition is usually accompanied by a history of an inflammatory process, with pain and tenderness in the left iliac fossae. Not infrequently an exploratory operation is a necessity to determine the true nature of the disease.

2. Benign tumors, principally adenomata and papillomata, must be considered. The adenomata are the most frequent variety. They are attached by either a broad base or a pedicle to the bowel wall, and are characterized by their mild injection, slight tendency to hemorrhage, and the lack of firm, indurated feeling presented by carcinomatous tissue. The papillomata are usually of the villous type and are quite red. They bleed easily when traumatized and have a soft velvety feel to the touch.

3. Ulcerative inflammatory strictures simulate the malignant tumors met in young patients. The duration of symptoms, the odor of the discharge, together with the smoothness of the surface and the lack of firm induration usually serve to make a differential diagnosis.

4. Blind internal fistulae possess an opening with more or less induration of their diverticula but lack tumor formation together with the appearance and feeling of carcinomatous tissue.

Whenever there is any doubt concerning the true nature of the disease, a small section of tissue should be obtained from the most suspicious area, and submitted for pathological examination. Undue emphasis should not be given a negative report when the clinical findings point to a

malignant process. Although there is considerable controversy as to the advisability of a biopsy in these tumors, and while it is unnecessary in the majority of instances, there are exceptions where it is perfectly justifiable. The ill-effects, if any, are certainly less detrimental to the patient than the progression of an undiagnosed tumor.

SUMMARY

1. Tumors of the lower alimentary tract may be separated anatomically into those of: 1. pelvic colon; 2. recto-sigmoidal juncture; 3. mid-rectum; 4. lower rectum, including the anal canal.

2. The mildness of symptoms in the early stages of cancer, in these different locations, may mislead as to the character of the disease.

3. The early symptoms herein described, when not otherwise accounted for, justify a thorough palpation and inspection of the suspected areas.

4. A biopsy should be done if tumors appear atypical.

DIATHERMY IN GONORRHEAL EPIDIDYMITIS. WITH REPORT OF ELEVEN CASES*

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THERE is no complication of gonorrhea that taxes our ingenuity to find a satisfactory remedy more than does epididymitis. Occurring in from twenty to thirty per cent of all cases of male gonorrhea, it is the greatest single cause of morbidity and loss of time, while it often produces the most disastrous effect on fertility.

PATHOLOGY

Upon gross examination at operation there is usually found involvement of the adjacent scrotal tissues, consisting of redness, edema, and swelling. The tunica vaginalis contains hydrocele fluid varying in amount from two to thirty cubic centimeters. A fibrinous exudate is present causing tissue agglutination. Often there are adhesions between the epididymis and the tunica vaginalis, or between the layers of the tunica vaginalis itself. The epididymis proper is swollen, purplish-red in color, and frequently small abscesses may be found throughout. The spermatic cord is thickened. Microscopically the most constant finding is large leucocytic invasion of both the connective tissue and the tubules of the epididymis. There is a proliferation of fibroblasts and often hyaline degeneration. The gonococcus may be obtained from the exudate.

TREATMENT

In recent years considerable thought has been given by urologists to the surgical treatment of epididymitis, since Hagner[1] described his technique of epididymotomy. That this satisfactory operation is not in greater vogue is probably because it entails hospitalization, general anesthesia, loss of time, and expense. However, it is of inestimable value in late cases, in those which do not respond to conservative measures, and where a frank abscess exists.

The expectant treatment, i.e., absolute rest, elevation and strapping of the scrotum, local applications, etc., is still widely followed. This is quite unsatisfactory, as the patient is forced to lose several weeks time, and to suffer great pain. Moreover, an operation for drainage may be necessary later.

In sedative diathermy we have a very valuable agent, especially when employed early and with careful technique. By this method we have found that we can produce relief from pain and decrease in swelling of the parts quicker than by any other plan save epididymotomy.

Diathermy is produced by the passage through the body of high-frequency electricity of many hundred milliamperes, or even an ampere, generating a great deal of heat, through tissue resistance. The frequency must be about one million oscillations per second in order to avoid motor and sensory effects, but the voltage is relatively low.

Professor Zimmerman, of Paris, has defined diathermy as: "a form of thermotherapy which utilizes electric energy for the production of thermal effects in the depths of the tissues." The effects of diathermy on tissues are:

(1) Production of internal heat,
(2) Stimulation of cell metabolism,
(3) Stimulation of phagocytic activity,
(4) Stimulation of vasomotor mechanism,
(5) Analgesia.

Normally the tissues react to inflammation by the production of local pyrexia. This heat produces an increase in cell activity and metabolism which together stimulate the natural body defences. Most

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pathogenic bacteria thrive at normal body temperature. Any increase in temperature of the surrounding media will retard their growth and activity. Thus local heat is a form of body defence against bacterial invasion.

Sedative diathermy, by raising the temperature of the deeper structures, aids the tissues in overcoming infection. In the case of gonorrheal epididymitis, it is thought the heat generated within the epididymis is sufficient to kill the gonococcus, since this organism cannot withstand a temperature of 42.5°C.

Various methods of applying diathermy for epididymitis have been advocated. Corbus and O'Conor[2] devised the fiber clamp electrode which conforms to the shape of the parts. Sinkoe[3] uses metal mesh electrodes. We have applied the principle of placing the active electrode in an electrolytic solution in which the testicle and involved epididymis are immersed.

Technique. The parts are prepared by cleansing with soap and water. The patient is seated on a wood chair upon which is interposed a block tin electrode six inches square covered with soap lather. This electrode is in firm contact with the skin of the buttocks. An earthenware bowl about eight inches in diameter and six inches deep, partly filled with normal saline solution and containing a three inch square block tin electrode which is fastened with adhesive plaster, is placed between the thighs and the affected testicle and epididymis are suspended therein. The scrotum is not permitted to come into contact with this active electrode, though no danger arises from contact of the skin of the perineum and scrotum with the rim of the bowl. The current is turned on very gradually and every few minutes it is increased by 50 to 100 milliamperes when the patient experiences a comfortable warmth. We must be guided by the patient's sensations, and sufficient milliampereage should be used, without producing discomfort. The duration of treatment varies with the tolerance of the individual, from thirty to sixty minutes. It may be repeated in twenty-four hours.

CASE REPORTS

We have studied the effects of sedative diathermy on eleven patients with gonorrheal epididymitis admitted to the Louisville City Hospital. All gave a history of recent urethritis. The onset of pain, and swelling of the parts, were from two days to three weeks before admission, the average time being ten days. All the patients showed an aggravated form of the infection due to lowered resistance, bad hygiene, neglect, and abuse of treatment. A total of fifteen treatments were required, two patients receiving two treatments each, and one patient three treatments. All showed immediate improvement following the first treatment except two who developed a slight rise of temperature though both experienced relief from pain. The average time in the hospital for this series was six days.

1. C. P. Right epididymitis, five days duration. Temperature 102°F., pulse 120, intense pain and swelling. Given 750 milliamperes diathermy for forty minutes. Decline in temperature to normal with complete relief of pain. The urine, which had contained large amount of pus, became clear except for shreds.

2. W. E. Right epididymitis, three weeks duration. Entered hospital on stretcher. Had been in bed two weeks under care of physician. Temperature 99.2°F., pulse 88. Given 700 milliamperes diathermy for forty minutes. Pain subsided. Second treatment the following day, 700 milliamperes for forty minutes. Complete relief. Left hospital next day, walking.

3. A. H. Left epididymitis, three weeks duration. Temperature between 101.8° and 103°F., pulse 96, leucocyte count 13,200. Intense pain and swelling. Given 900 milliamperes for forty minutes. Temperature declined to normal with relief of pain.

4. B. L. Left epididymitis, four days duration. No fever. Given 700 milliamperes for forty minutes. Next day temperature rose to 101.4°F. Second treatment then given, 700 to 900 milliamperes, and temperature receded to normal. Next day there was a slight rise in temperature, and the third treatment was

given, nearly 1000 milliamperes, for forty minutes. Patient left hospital the following day improved.

5. W. K. Right epididymitis, one week duration. Temperature 102°F. Given 750 milliamperes for forty minutes. Temperature declined to normal with almost complete relief of symptoms.

6. N. T. Right epididymitis, two days duration. Temperature 102.6°F. Given 650 to 700 milliamperes for forty minutes. There was a rise in temperature the next day to 104°F. Second treatment given, 750 milliamperes for forty minutes, with reduction in temperature to normal and relief of symptoms.

7. E. H. Right epididymitis, ten days duration. Temperature 103°F., pulse 102. Given 800 milliamperes diathermy for forty minutes. Temperature receded to normal with relief.

8. N. C. Left epididymitis, four days duration. Temperature 100°F. Given 700 milliamperes for forty minutes. Temperature became normal, but rose again next day, and again declined without further treatment.

9. W. W. Left epididymitis. Temperature 101.8°F., pulse 78. Patient given conservative treatment for two days, and temperature rose to 103°F. He was then given diathermy, 650 milliamperes for forty minutes. Temperature declined to normal and he left hospital next day.

10. J. B. Left epididymitis, one week duration. Temperature 99.4°F., pulse 98. Given 800 milliamperes diathermy. Left hospital next day improved.

11. B. H. Left epididymitis. Temperature 100°F., pulse 90. Given 700 milliamperes diathermy for forty minutes. Left next day improved.

In a second series of ten cases of acute gonorrheal epididymitis (one bilateral), the patients were treated either conservatively (absolute rest, elevation and local applications of boric acid wet dressings), or by conservative measures plus epididymotomy, no diathermy being used. The average time of these patients in hospital was nine days, and nearly all required opiates for relief of pain. Recovery was satisfactory in all.

CONCLUSIONS

Sedative diathermy is the treatment of choice in gonorrheal epididymitis for the following reasons:

(1) It inhibits bacterial growth and activity and kills the gonococcus at a certain temperature.

(2) It stimulates cell metabolism thus increasing tissue resistance.

(3) It stimulates phagocytosis by increasing leucocytic invasion.

(4) It increases blood supply to the parts and aids absorption of exudates.

(5) It has a marked analgesic action.

(6) It relieves venous congestion.

REFERENCES

1. Hagner, F. R. *Annals of Surgery*, 1908.
2. Corbus and O'Conor. *Am. Jour. of Urol.*, August, 1924, xii, 132.
3. Sinkoe, S. J. *Urologic and Cutaneous Review*, September, 1925, xii, No. 9.

THE IMPORTANCE OF PATHOLOGY IN THE PRACTICE OF SURGERY*

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NO other branch of medicine affords such an excellent opportunity to study pathology in the living as does surgery. Inasmuch as this specialty deals in the main with the repair of pathological conditions it behooves the surgeon to be familiar with the more common pathological lesions so that he may be able to identify and correct such defects with greater proficiency.

The first prerequisite of a surgeon should be a thorough understanding of the pathological nature of the surgical conditions with which he has to deal. The surgeon should be cognizant of the remote possibilities that may follow apparently insignificant surgical lesions. More than a superficial knowledge of the pathology of surgical diseases is necessary for the great hazards encountered in some cases while performing abdominal explorations. Accidental surgical findings where the lesions are congenital or acquired sometimes present themselves to the unsuspecting surgeon and only one experienced in pathology will intelligently manage the presenting lesions with best results.

A male, aged 65, was explored for an abdominal tumor in the right lumbar region. After careful examination it was recognized that the tumor was a cystic kidney. With the knowledge that this condition is usually bilateral further examination showed that the left kidney was also polycystic. In the hands of the inexperienced the right kidney might have been removed.

It is most discouraging when we are reminded that approximately forty per cent of cases are incorrectly diagnosed as proven by operation or post-mortem investigation. Largely contributing to such deficiency in recognizing surgical diseases is the striking lack of autopsies in most of our hospital cases. Post-mortem studies would enable the surgeon to familiarize himself with the existing lesions and coordinate them with clinical manifestations; they would also expose mistakes in diagnosis, errors in judgment and technique.

Not infrequently one encounters a surgical case whose clinical features are too obscure to permit an accurate diagnosis. Often an exploratory laparotomy is inevitable when it is our only means of revealing the nature of the lesion. Even in the face of an opened peritoneal cavity one sometimes has to delay his final opinion until the autopsy owing to marked pathological changes. If a necropsy is omitted the case remains shrouded in obscurity.

A female, aged 40, came to Lebanon Hospital presenting abdominal ascites and irregular abdominal masses. Tuberculous peritonitis and malignant new growth were considered, the latter being favored. Assuming the diagnosis of a malignant growth to be correct, where was the origin? The patient was explored. Serosanguinous fluid was found; the intestines were matted together by dense growths; the liver showed extensive metastases; small growths were present on the peritoneum. The condition was unquestionably malignant as proven by biopsy. The seat of origin was difficult to decide although we were inclined to believe it was in one of the ovaries. Only an autopsy would have decided the point in question.

A female, aged 50, was suddenly seized with abdominal pain and went into collapse. There was a large mass in the left lower quadrant and lumbar region. The patient appeared to have an internal hemorrhage, and was thought to have a twisted ovarian cyst. Operation disclosed a large retroperitoneal tumor probably of renal origin. Autopsy revealed a large

* Read before the Bronx Surgical Society, March 24, 1926.

hypernephroma of the left kidney in which there had occurred a profuse hemorrhage.

One can readily appreciate from the above cases the difficulty of accurate recognition of diseases often even after exploration. In such type of cases, as well as in others where death ensues, we should particularly avail ourselves of every opportunity to study pathological lesions by means of autopsy.

The great bugbear of every surgeon is that a fatal outcome may ensue in a case expected to survive, especially where the lesion has apparently been very slight. If death does occur he may look with suspicion upon his technique or perhaps feel that he may have overlooked some other pathological condition. Often only by a thorough autopsy will there be found some hidden cause for the death.

I have in mind a child seven months old who was operated upon for intussusception of the ileo-cecal variety. Reduction was rapid and not difficult. Following the operation the child did well for two days when it suddenly became worse and died. It was thought then that death resulted from the usual shock and toxemia associated with such condition. Autopsy revealed a strangulated gangrenous loop of small intestine due to a volvulus. This was entirely independent of the intussusception which had been properly managed.

An infant one week old was given 25 c.c. of whole blood through the anterior fontanelle. No incompatability of bloods existed. About one hour after the injection the child died. Suspicion was aroused in the minds of those seeing the child that death was from an intracranial hemorrhage due to the transfusion. This, however, was not present at the autopsy.

Another infant who was given a number of saline solution injections in a period of one week through the anterior fontanelle died after the fifth injection. Here a brain hemorrhage was found due to a perforation of the sinus.

A female, aged 36, who was delivered by Cesarean section because of a dystocia due to a uterine fibroid, died three days after the operation. Clinically she presented signs of pneumonia thought to be entirely responsible for her death; beginning peritonitis was also suspected. At autopsy there was also found a diffuse suppurative plastic peritonitis caused by a degenerated infected fibroid which had perforated. Without a post-mortem examination the peritonitis would undoubtedly have been attributed to faulty technique.

A female, aged 35, was admitted to Lebanon Hospital in coma which came on very suddenly after she complained of slight abdominal pain. Those who saw her prior to admission ventured the opinion of a cerebral accident. At autopsy a hemorrhagic pancreatitis was found.

A child 3 years old sustained a crushing injury of the right forearm necessitating amputation because of gas bacillus infection. An injury to the lung was suspected. There was also some suggestion of an abdominal injury the nature of which could not be determined clinically. The child finally succumbed. The autopsy disclosed a ruptured left lung with a hemothorax containing hemolytic streptococci, and a ruptured spleen which had stopped bleeding and about which there was an abscess. This case is very instructive because it proves that a ruptured viscus, especially the spleen, may sometimes stop bleeding spontaneously and thus make operative interference unnecessary.

A female, aged 50, was subject to repeated attacks of dyspnea and cyanosis. The condition reponsible was thought to be a substernal thyroid. An imperative tracheotomy was done but without success for reasons disclosed post mortem. Then we found a large spindle-cell sarcoma almost closing off the trachea entirely in the superior mediastinum.

The cases cited above are only a few chosen to emphasize the value and need of post-mortem study. We must bear in mind that by such means only can we solve cases whose recognition cannot be established clinically. Not infrequently a post-operative death cannot be explained by autopsy.

Post-mortem investigation should not be delegated to one inexperienced, who may confuse rather than enlighten the situation. Where possible the surgeon himself or some competent member of his staff should personally witness the autopsy, so that he may be impressed with the findings which may perhaps reveal

errors in diagnosis or technique. It would also help him to interpret similar symptoms on the basis of existing pathology.

Cullen, in an editorial in *Surgery, Gynecology and Obstetrics*, November, 1925, stated that it would be a great comfort to the surgeons to have a general pathologist on hand at all times to advise him in obscure conditions. He highly recommends a training in pathology prior to entering the practice of surgery.

A knowledge of surgical pathology is of the greatest importance, for without it the operator cannot exercise the proper judgment and skill in coping with surgical conditions. This is of prime importance in surgery of the abdomen. The benign lesions of the stomach must be differentiated from the malignant. If the latter is present the extent of involvement and the presence of any visceral metastases must be recognized.

A case in point is a male, aged 35, who was operated upon for a suspected duodenal ulcer or diverticulum. At the operation no such lesion existed. There were large, hard, discrete masses in the mesentery of the small intestine apparently large lymphatic glands. The diagnosis of Hodgkins' disease was immediately entertained and later proven at autopsy.

Carcinoid tumors of the small intestine and appendix form a very interesting type of tumor, often considered malignant by those unfamiliar with it when in the majority of instances it proves benign. The lack of such knowledge concerning their behavior often brings an unfavorable prognosis from the surgeon and much to his surprise the patient survives the operation without recurrence.

In a diseased biliary system one must conceive of the remote effects on local or more distant organs. One of our patients was operated upon for cholelithiasis when, in addition, it was found that a fistula existed between the gall bladder and the duodenum. Its non-recognition in the hands of the inexperienced surgical pathologist would undoubtedly have led to meddlesome surgery. On many occasions the pancreas, because of its hardness secondary to an infected biliary tract, is considered malignant. Secondary changes in the liver are very common as a result of a diseased bile tract.

In the female pelvis one frequently finds pathologic changes that demand accurate definition before operative measures are instituted. In the removal of a papillary cystadenoma or adenocarcinoma of the ovary it is important to exercise all necessary skill to prevent rupture, for if that occurs the papillary growths implant themselves readily on the peritoneum with an unfavorable outlook.

In the management of breast tumors one cannot always tell with certainty the character of the growth but the experienced surgical pathologist will have a decided advantage in determining such questions.

A female, aged 40, had an irregular mass in her left breast and no palpable regional glands. It simulated malignant growth but because of the history of trauma and the character of the mass, it was thought to be traumatic fat necrosis. The opinion was confirmed by its gross and microscopic appearance after removal. No radical amputation was necessary.

The microscopic study of pathological material seems unnecessary to some surgeons and is very frequently neglected in view of an apparent gross pathological diagnosis. We have often received in the laboratory innocent-looking specimens which after careful microscopic study yielded evidence of malignancy. Apparently benign lesions should not be regarded lightly unless the microscopist verifies their benign character.

In closing, I realize that these facts are very elementary and are undoubtedly familiar. Nevertheless they deserve repetition because of their extreme importance to the surgeon. A knowledge of pathology not only opens to a broader view of surgical diseases but also helps to maintain a high surgical standard.

REPORT OF TWO OSTEOCLASTIC TUMORS OF THE BONY PELVIS

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THE cases reported here were seen recently at the Hospital for Joint Diseases. The first, that of a perithelioma of the pelvis, was characterized by rapid and progressive destruction of bone and resulted in death; the second, a giant cell tumor, was discharged with bone regeneration throughout the destroyed area.

There are no recent reports in the literature of cases similar to ours. The only cases we were able to find are the two quoted by Howard and Crile.* One reported by Jaffe in 1874 was in a male, 24 years of age: a pulsating tumor of the left iliac bone metastasised to the lung and pleura. The second, reported by Spiegelberg in 1894, was in a female 62 years of age: multiple tumors of bone with secondary involvement of the ilium, thought to be an endothelioma of the lymph spaces.

The diagnosis of bone tumors in general, is no simple matter for the roentgenologist. The various and diverse changes any bone tumor may produce are indeed legion, and experience has taught the careful roentgenologist to be extremely cautious in his interpretations. Even with what appears to be a characteristic tumor one often meets surprising refutation in the operating room or under the microscope.

The study of the tumors in flat or spongy bones recently seen at this institution has perhaps emphasized the difficulties of using standard and accepted criteria in diagnosis. Difficulties of roentgenographic interpretation are often resident within the tumor proper. Since diagnosis depends on either bone production or bone destruction, it can readily be seen how a multiplicity of bone conditions may produce similar changes, and when one considers the atypical reactive changes in flat bones the difficulties of accurate diagnosis are perhaps apparent.

Tumors in long bones are common and one reaches a degree of efficiency in their classification. The reaction of flat bones to the invasion of tumor cells is somewhat different from that in long bones. The importance of differentiating between the various types of metastatic bone involvement is perhaps not pressing, but the primary tumors demand accurate differentiation. Are the changes in flat as compared with long bones due to a difference in the character of the bone marrow, the proportion of the cancellous element or the relatively denser cortex?

The *x*-ray film might seem so obvious and palpable a representation as to be evidence sufficient in itself of the particular type of pathologic process it represents; but experience proves this to be a fallacy. While at times a particular tumor may fall into a particular category, it is nevertheless true that many do not and corroborative, collateral evidence is essential to a diagnosis.

The writer has had the good fortune to see many tumors of flat bones and is convinced that much can be added to our knowledge of the subject by the careful observation of those cases that come to our attention. It is this type of tumor in particular which impresses one with the diagnostic limitations of the *x*-ray. Neither the *x*-ray nor the microscopic section is absolute and final. The course and progress of the case and one constant—time—may actually be the only means on which the final opinion may be based.

CASE 1. A. G., 9070, schoolboy, aged 16, born in Hungary, was admitted to the hospital, July 25, 1925. Diagnosis: Sarcoma of the pelvis.

* Howard, W. T. and Crile, G. W.: A Contribution to the Knowledge of Endothelioma and Perithelioma of Bone. *Annals of Surgery*, September, 1905, p. 359.

Died, September 13, 1925. Family and previous histories negative. Chief complaint on admission, pain and mass in the left inguinal region, and loss of weight. Present history began about one year prior to admission. In September, 1924 while exercising struck the upper portion of the left thigh. He experienced slight pain at first but it gradually increased in severity and was worse at night. Pain began in the left inguinal region and radiated down the thigh into the left knee, continuous in character and increased in motions about the hip joint. Had lost 15 pounds in two months, became noticeably paler and weaker with loss of appetite and sleep. Limp aggravated. Although pale and anemic, he did not appear to be acutely ill. Physical examination was negative excepting that relating to the lower left abdomen. A tender globular mass was felt over the left groin apparently connected with the pelvis. Extreme tenderness was present over the upper and outer aspect of the femur. There were enlarged, tender, femoral and inguinal glands. Rectal examination revealed a large elastic tumor in the left half of the pelvis encroaching upon the rectum and almost completely obliterating its lumen. On admission the temperature was 101°; pulse 96; respirations 22. Urine negative. Blood examination: Hn. 75%; r.b.c. 4,626,000; w.b.c. 11,725; p. 71; l. 23; t. 2; e. 2; m. 2. Wassermann reaction negative. *X*-ray report (plate number 1448) July 26th: "There is an extensive destructive process involving the left ilium about the acetabulum. There is undermining of the acetabulum with multiple areas of destruction, periostitis of the inner wall of the acetabulum and destructive ostitis of the ascending ramus of the pubis. The contiguous margins of the head of the femur appear to be involved. The hip joint space is narrowed with apparent involvement of the cartilage of the joint proper. Conclusions: Osteomyelitis of the left ilium and ascending ramus of the left pubic bone. Mode of invasion, periostitis, extensive atrophy and joint involvement would not appear to indicate a malignant process." (Fig. 1).

FIG. 1. Case 1. Perithelioma of the pelvis. On admission. *X*-ray diagnosis, osteomyelitis.

FIG. 2. Case 1. Perithelioma of the pelvis. Later stage.

The general condition of the patient became progressively worse. Pain and tenderness became increasingly severe. Operation by Dr. E. Eising, August 3, 1925, for sarcoma of the os pubis. Reexamination of the roentgenograms prior to operation still seemed to indicate an osteomyelitis although the opinion of the clinician was that we were dealing with a giant cell tumor. Operative findings: "The tumor was not nearly as evident as one would have expected from the clinical findings. Aspirating needle inserted in several directions with negative results. The fibers of the iliacus muscle were separated for a considerable distance. In the lowermost and internal angle of this separation a dark colored, cystic mass came into view. Aspiration negative. This dark mass was then opened and found to be filled with a hemorrhagic, oatmeal-like material. This was removed and a finger, inserted into the cavity,

impinged on the posterior surface of the os pubis, which was roughened and detroyed. This bone was fragmented and it crumbled under the finger. As much bone as possible was removed, provoking considerable bleeding which had to be checked by packing." Gross anatomical inspection of the mass appeared to indicate a giant cell tumor. The pathologist's report, however, was: "The specimen consists of several pieces of bone and several pieces of soft tissue; both the bone and the soft tissue show considerable necrosis. Sections of the bone show atrophy of the trabeculae and trabecular spaces filled by large amounts of cellular material, which on section are completely necrotic except for one place between the trabeculae where a sarcoma with perithelial arrangement is seen. The soft tissue also shows marked necrosis by a tumor of the perithelial type. Diagnosis,—sarcoma of bone, perithelioma."

Fig. 3. Case 1. Perithelioma of the pelvis. Later stage.

The immediate post-operative condition of the patient was good, but pain at the operative site persisted. On the fifth day post-operative, the temperature was 101°, the pulse 104, respirations 24. Blood examination then showed: Hn. 60%; r.b.c. 3,904,000; w.b.c. 24,000; p. 90; l. 10; and a later examination showed; Hn. 45%; r.b.c. 3,280,000; w.b.c. 19,400; p. 88; l. 12. The *x*-ray examination showed a considerable extension of the process as well as a spreading of the inner wall of the acetabulum, with consequent protrusion of the head of the femur into the pelvis; diagnosis, malignant sarcoma of the pelvis. (Fig. 2). From this time the patient's general condition declined. Pain at the site of the operation became so severe that it required repeated doses of morphine. He was unable to take nourishment, became weaker, drowsy and at times irrational. Radiographic examination of the lungs on September 5, 1925 showed metastatic nodules in the lungs. Died September 13, 1925.

Case 11. G. F., shipping clerk, aged 17, born in the U. S., was admitted to the hospital February 13, 1925. Diagnosis, giant-cell tumor of pelvis. Discharged August 13, 1925. Family and previous histories negative. Chief complaint was pain and stiffness in the right hip and limp. He had been struck by a heavy case the previous March and about one month later experienced pain and stiffness in the right hip. He was roentgenographed at another institution at the time and was informed that the plates were negative. The condition became rapidly worse; swelling and pain increasing markedly. His general condition was very good. There was a palpable mass at the upper end of Poupart's ligament and another between the symphysis and the lower right quadrant of the abdomen. Both masses were immobile, tender only on deep pressure and on movements about the hips. External rotation, flexion and abduction painful and limited. Rectal examination showed an immobile mass about the size of an orange which appeared to be on the internal aspect of the ilium. The rectal mucous membrane was

Fig. 4. Case 11. Giant-cell tumor of the pelvis. Showing absorption of the ascending ramus of the pubis.

freely movable over this area. The inguinal and femoral glands were enlarged. On admission temperature 99°, pulse 74, respirations 18. Blood examination: Hn. 65%; r.b.c. 3,780,000; w.b.c. 7,400; p. 76; l. 21; b. 1; e. 1; m. 1. The urine was negative. *X*-ray examination (plate number 560): "The right pelvis shows an infiltrating tumor involving the ascending and descending rami of the pubic bone, as well as part of the ischium on the right side. The ascending ramus of the pubic bone is completely destroyed, whereas the descending ramus and ischium are partly eroded. These bones are irregularly expanded and show a limiting border or margin. Portions of the tumor show irregular trabeculation. A sharp line of demarcation is noted between normal and pathological bone. The appearance suggests a tumor of the giant-cell type." (Fig. 4).

Operation, February 26, 1925, by Dr. P. Grausman: "A mass protruded from the pubic bone external to the internal ring. A dissection was made of this mass and immediately there was a free hemorrhage of fresh blood mixed with old clotted blood. Incision was enlarged into the mass which proved to be a large cavity, probably cystic degeneration of a sarcoma. The entire horizontal portion of the right pubis was completely involved in this mushroom like mass, which was only a shell of bone, about the size of a grapefruit." Dr. Jaffee, the hospital pathologist, reported: "Frozen sections and paraffin-imbedded tissues show a tumor with numerous thin-walled blood channels some of which are wide, large, filling almost an entire low power field; also numerous small channels lined by endothelial cells, which are empty. Some of these channels are blood channels, others undoubtedly lymph channels.

The tumor structure is bridged by these vascular channels, between which there is a moderately cellular connective tissue growth in which there are giant cells. Examination of numerous portions of the undecalcified neoplasm shows marked atrophy of the bone trabeculae, which have been caught between the cysts and numerous areas of osteogenic proliferation with hyaline cartilage cells undergoing calcification. The walls of the cysts are made up of a cellular connective tissue. The lymph nodes of the inguinal region show no tumor metastasis. Diagnosis: giant-cell tumor" On March 3rd, 4th and 13th, the patient received 12,000 mgm. hours of radium applied in the form of packs. The post-operative temperature was 98°, pulse 88, respiration 22. *X*-ray examination on March 23, 1925 showed bone regeneration in the descending ramus of the pubis, posterior ramus of the ischium and posterior portions of the acetabulum (Fig. 5). During the latter half of March, deep *x*-ray therapy was administered over the affected area. Convalescence continued uneventful. *X*-ray examination prior to discharge showed bone replacement through the operated region.

General survey: An adolescent male presented himself with pain in the right half of the pelvis more marked on movement and on direct pressure. Examination revealed a tumor encroaching on the rectum. The tentative diagnosis was giant-cell tumor of the pelvis, which was corroborated by roentgenography, operative findings and microscopic sections. Radium and *x*-ray therapy instituted, with considerable bone regeneration. Protracted convalescence. Discharged with a sinus.

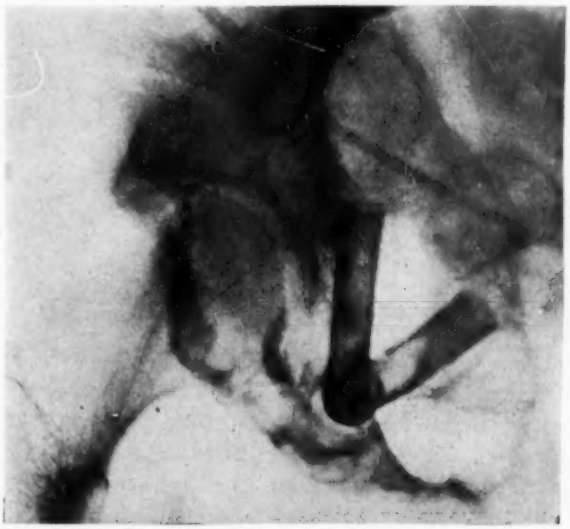

FIG. 5. Case 11. Giant-cell tumor of the pelvis after operation and radiation, showing bone regeneration.

DISCUSSION

A comparative study of the effects produced by a giant-cell tumor and a malignant sarcoma in flat bones is afforded by a review of these two cases.

Both cases were adolescent males in whom a tumor developed following a trauma. In both a palpable mass was demonstrated which was felt in the rectum. In both cases there was a profound anemia, and in the malignant tumor a high polymorphonuclear count appeared to

indicate an infectious process. Our chief interest in both cases is the roentgenological differences noted.

The perithelioma began as a locally destructive process in the lower segment of the left ilium. Irregular destruction and erosion of bone resulted, spreading in all directions, but chiefly in the long axis of the bone. The inner aspect of the acetabulum showed early involvement and even the cartilage of the hip joint appeared to be destroyed. There appeared to be irregular punctate destruction as well as atrophy and involvement of the head of the femur. As the case progressed certain unusual features manifested themselves. The destructive process extended through the inner wall of the acetabulum and appeared to disarticulate the ilium, and resulted in a secondary inward displacement of the head of the femur. No purely infectious process would disarticulate bones. On close analysis the individual areas of destruction were unusual. Areas of normal bone alternated with zones of destruction. It seemed that the growth had undermined the foundation of the cortical bone, leaving the superstructure free and detached as small islands of bone, of apparently normal texture. Osteomyelitis of the pelvis as a rule destroys large sections of bone locally and spreads peripherally, whereas here multiple areas of involvement early manifested themselves. The transition between normal and pathological bone was sudden and atrophy of the ilium beyond the affected part was absent. Had this been an infectious process, there probably would have been irregular atrophy of the uninvolved portions of the ilium. There was early erosion, elevation and thickening of the periosteum, chiefly on the inner aspect of the joint. There were no sequestra or sinus formations at any time. Had this been an infectious process, some bone reaction should have manifested itself. Reactive ostitis occurs in all osteomyelitic processes with the exception of tuberculosis, and this latter condition was not considered, in view of the absence of tuberculous atrophy, which is fairly typical. A striking feature of the condition was the rapid extension of the process under observation, rapidly metastasising to the lungs.

The giant-cell tumor, on the other hand, extended chiefly along the long axis of the involved part, destroying the medulla and irregularly expanding the bone. The actual destruction appeared to be greater than that which occurred in the malignant tumor. A definite limiting border or capsule was demonstrated on the inner aspect and the transition between normal and pathological bone was sudden. Irregular trabeculation was present throughout the growth. No disarticulation of the pelvic bones resulted. Healing resulted by dense bone replacement throughout the entire tumor.

The following conclusions appear to be warranted by the histories detailed above:

1. Established roentgenological criteria of diagnostic aids in the interpretation of malignancy in long bones are inapplicable to similar involvement in flat or spongy bones.

2. Sarcoma of the malignant type is often indistinguishable from osteomyelitis in flat bones.

3. Gross anatomical inspection of a tumor is not an infallible guide in the determination of malignancy.

4. A logical diagnosis of malignancy depends on a combined clinical, pathological and roentgenological study. Conclusions based on any one method are hazardous, unreliable and often erroneous.

In conclusion, I wish to thank Drs. H. C. Frauenthal and Gustave Bucky for permission to publish the material of the department.

GANGRENE OF A HERNIAL SAC. REPORT OF A CASE

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AS far as I am able to learn, there is no record of a strangulation of a hernial sac. The following case is, I believe, the first to be reported.

The patient, a machinist, about 40 years of age, felt a slight twinge of pain in the right inguinal region while lifting a weight five years ago. At various times thereafter he experienced slight pain in the groin, never incapacitating him from work, however, until April 21, 1926.

From then to April 23rd he was in bed with general abdominal pain and severe vomiting, which his physician at first looked upon as colic due to overindulgence. On the third day, when I was called, there was a tumor in the right inguinal region, with every evidence of strangulated hernia; and immediate operation was decided upon. The usual inguinal incision exposed at once a very dark, doughy mass. The ring at the neck of the tumor was incised, but this did not permit the delivery of what all present supposed to be strangulated intestine. With gauze dissection, I endeavored to free the mass from the firm adhesions found all around the ring up into the abdomen. The neck was delivered to about an inch and a half, and found quite freely covered with serpiginous veins resembling those of the omentum or mesentery.

At this stage, I was in the dark. Feeling that an intestinal resection had to be done, if this were intestine, I saw no harm in making a small incision in the fundus of the strangulated mass. There was no discharge of any kind from this incision, which exposed the abdominal cavity to inspection and palpation. Introducing the index finger, it freely circled within the abdominal cavity as far as it could reach. Intestines could be seen floating in the abdominal cavity inside of the ring, which had now been enlarged. The incision in the fundus of the mass, which was about the size of a large lemon, was enlarged. The wall of the tumor was about a quarter of an inch in thickness, and because of its gangrenous condition its true nature could not be determined. The free movement of the exploring index finger, and the nature of the adhesions, made me conclude that the mass was the hernial sac itself, gangrenous. This decided, the neck of the sac was transfixed and tied and the mass was removed.

After the operation vomiting ceased; and on the following day the patient had a voluntary bowel movement. On April 28th, the fifth day after operation he insisted upon being removed from the hospital to his home. On May 5th he was out of bed, and on May 10th he was out of the house. He has resumed work; and has visited my office several times since.

DISCUSSION

After delivering the mass by blunt dissection, I found the serpiginous veins in the neck lost in the mass. Had it been intestine, the veins would have been in the mesentery, not in the walls.

My index finger, introduced as far as possible, circled freely within the abdominal cavity. This could hardly have been possible had the mass incised been intestine.

The history of the case led me to conclude that at the time of the first attack, five years ago, the omentum came down and finally became adherent to the ring and organized with the sac.

The vomiting and severe pain during the last attack were evidently due to intestine in the sac, which dropped back in the interval between my examination and the operation.

Concerning the cause of the condition found at the operation one can only speculate. It is quite possible that the omentum became firmly attached to the sac (for the adhesions were very dense), thus producing its unusual condition. The mass was not intestine, for its ligation would have resulted fatally. Nor could it have been omentum, for my finger entered a cavity; a hernia of the omentum would have been solid. Nor yet could it have been an unusual condition of the appendix as suggested to me by a well known authority on hernia; the foregoing description of the mass would preclude this.

What I wish to illustrate by this report is the possibility of a hernia sac becoming so highly organized as to closely resemble a strangulated intestinal hernia.

SEPARATION OF THE EPIPHYSIS OF THE LESSER TROCHANTER OF THE FEMUR. REPORT OF CASE

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CASES of fracture of the lesser trochanter of the femur are fairly common. Separation of the epiphysis of the trochanter minor, as a clinical entity, is rare. As a matter of fact there is little information that can be obtained regarding this subject from the English literature.

It may be mentioned for emphasis that the trochanter minor is the site of the insertion of powerful muscles. It is therefore surprising, from a clinical point of view, that separation of its epiphysis is not seen more frequently. In my experience, which is by no means as extensive as any of the authors herein quoted, the epiphysis of the lesser trochanter unites with the shaft at about the eighteenth year.

"The epiphysis of the lesser trochanter probably unites with the shaft at about the eighteenth year." (Poland.)

"The epiphysis for the greater trochanter appears during the fourth year and unites at the age of eighteen or nineteen." (Poland.)

"The lesser trochanter appears at thirteen and unites during the eighteenth year." (Poland.)

"One epiphysis for the small trochanter develops in the thirteenth or fourteenth year and joins the shaft at the eighteenth year." (Pringle's Fractures and Their Treatment.)

"The center for the head appears about the end of the first year, that for the greater trochanter about the fourth year, and that for the lesser trochanter about the fourteenth year. The epiphyses unite with the shaft in the following order and time: lesser trochanter, seventeenth year; greater trochanter, eighteenth year; head, nineteenth year." (Roberts and Kelly's Fractures.)

Ossification in the center for the head appears at the end of the first year; joins about the eighteenth year. Greater trochanter appears at the fourth year; joins shaft about the eighteenth year. Lesser trochanter appears from the thirteenth to the fourteenth year; joins shaft about the eighteenth year. (Gray's Anatomy.)

"At the junction of the neck and shaft of the inner aspect of the femur there is a bony prominence which is probably the lesser trochanter. This prominence is definitely a portion of the shaft and not a separate epiphysis. A separate scale-like epiphysis appears over this bony prominence, at times, about the ninth year. This is completely ossified and united with the shaft during the sixteenth year." (Cohn's Normal Bones and Joints.)

REPORT OF CASE

F. N., aged 13, schoolboy, was admitted March 25, 1926 to the surgical service of Dr. J. F. Connors at Harlem Hospital, New York City, complaining of severe pain in the *left* hip, which was flexed at about 150°. Pain was elicited on extension but no pain on flexion or on abduction, which latter was normal. Inversion and eversion were normal, and only slight pain was felt on marked eversion. There was no shortening. Roentgenograms showed a separation upward of the epiphysis of the lesser trochanter of the left femur (see illustration).

About one month previously, while running around an athletic track the boy was suddenly seized with a sharp, knife-like pain in the left hip, severe enough to compel him to stop immediately. The pain gradually subsided and in 25 minutes it had entirely disappeared.

One day before admission, the boy was again running around the track when a similar pain seized him in the left hip. This time it was so severe that he fell upon his hands with his legs outstretched. He was unable to rise. In half an hour the pain had gradually disappeared. Then he got up and tried to walk and, to use his

own words, "something would catch me in the left hip," causing a sharp, knife-like pain so that he dragged his left leg. The limb was held at full extension with external rotation and abduction, and favored with as little weight as possible. This "catching at the hip" continued until the next day. The boy had to be carried to the hospital and on admission a diagnosis of acute arthritis of the left hip was entered.

Family History. The father and mother are living and well. There is no given family history of tuberculosis, cancer, heart disease or kidney trouble.

Previous History. Measles in 1920. Whooping cough as a child. Frequent sore throats for which reason tonsils and adenoids were removed in 1923.

Otherwise the history is unimportant.

Routine physical examination revealed nothing remarkable except the local condition.

Extremities. Manipulation of the left hip causes pain, which is increased on adduction with limitation of motion of the leg. There is no shortening, no swelling and no redness. The right lower extremity is normal.

Progress. The boy was kept in bed. A plaster spica was applied from pelvis to toes with the thigh flexed at about 110° and in slight external rotation. After three weeks there seemed to be sufficient improvement to warrant the application of a short spica reaching to the knee, with the hip at an angle of 160°. After another interval of three weeks a roentgen-ray examination of the injured area showed that the separated epiphysis was at a slightly elevated position, and union was satisfactory. It was felt that sufficient progress had been made to allow the boy to walk in a new spica. This was applied with about 10° flexion of the hip. The patient was sent home and returned to the Out-patient Department at stated intervals. Within three weeks from date of discharge from hospital the walking spica was removed. As far as could be determined by careful examination there was no limp or irregularity in the gait. No pain or discomfort appeared to be elicited on manipulation. There was no disturbance of function.

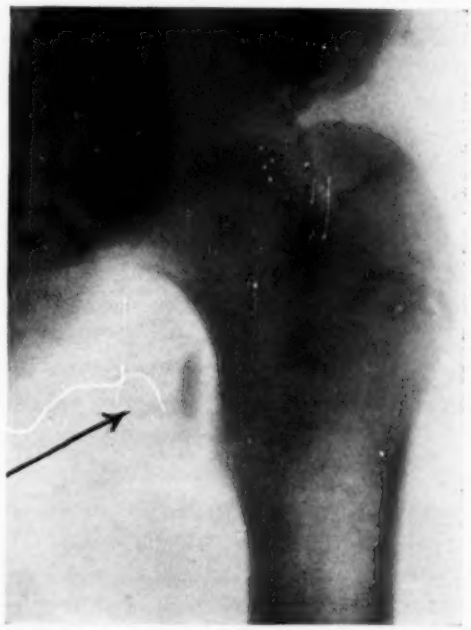

FIG 1.

THE AMERICAN JOURNAL OF SURGERY

EDITORIALS

FRACTURES OF THE HUMERUS

An interesting and well-considered study of fractures of the humerus is that of Mandel Weinstein in this issue of the JOURNAL. Among the things that it emphasizes is the importance of abduction, traction and suspension, in bed, in the treatment of fractures through the upper end of the humerus. We would go further than Weinstein and recommend this bed treatment, for about the first two weeks, in the management also of fractures through the shaft. We admit that fracture of the shaft, especially of the lower half, can sometimes be treated satisfactorily in an ambulatory splint or dressing that allows for suitable traction. We believe, however, that reduction can be best supervised and controlled by traction in bed. To break one's arm is a very serious matter—quite serious enough, it seems to us, to make it worth while for any person, however important his work may be, to give up two or more weeks of his time to secure the best possible management of his injury. Indeed, we believe that a fortnight thus spent in bed will not only make for the best end-result but will also make for the shortest period of disability. At the end of about two weeks there is usually sufficient consolidation and muscle relaxation to make a relapse to malposition unlikely if ambulant treatment is then substituted for recumbency. The Jones splint provides for traction and is intended for primary ambulant treatment of shaft fractures. It is a good device as a temporary or first-aid expedient, but, as Weinstein found and as other surgeons have also noted, it often fails to secure and maintain satisfactory reduction.

For supracondylar and for some other humerus fractures into or about the elbow-joint Jones' position (acute flexion) usually secures the best reduction and the optimum end-result. All fractures of the humerus other than those in or about the elbow are best treated, in our opinion, by traction; and when the fracture is in the upper end of the humerus it is especially important that this should be combined with abduction and external rotation. Indeed, in all fractures of the humerus near the shoulder, that is whether involving the surgical or the anatomical neck, abduction is the most important part of the treatment. The upper fragment or fragments cannot be controlled, and alignment is to be secured and function is to be preserved by the positional management of the long lower fragment—the shaft of the humerus. This requires: first, *traction*, to overcome overriding, when present; second, *abduction* (usually to about 110°, but further if indicated roentgenographically); and third, *external rotation* (to line up the shaft with the rotated head, to prevent shortening of the internal rotators of the shaft, and to secure maximum range of scapular rotation in case of shoulder stiffness). These are best secured by treatment in bed.

To be sure, abduction to 90°, or even more, can be maintained on an aeroplane splint, but this does not provide for traction and it supports the arm in *internal* rotation. Traction and external rotation can be secured in a Thomas splint and abduction can be arranged by supporting this with another Thomas arm splint, bent for the purpose, or by some other device, extending up from the waist as a strut. Abduction, external rotation and traction can also be maintained in a cumbersome plaster-of-Paris cast involving the torso, the arm and the forearm. As we pointed out in *International Clinics*, Vol. ii, (June) 1926, all

of these latter devices possess the very serious disadvantage, in addition to others, that they immobilize the shoulder. In fractures of the upper end of the humerus it is important, we believe, that *the shoulder-joint* (indeed, the elbow-joint also) *should not be immobilized.* The abduction-rotation-traction treatment, in bed, of upper-end fractures of the humerus is not only the method simplest to apply, and the most comfortable to bear, but it provides passive motion of the shoulder whenever the patient shifts the position of his body, active motion of the elbow by flexion and extension of the forearm, and, within a restricted range, active motion of all the muscles of the extremity.

Despite painstaking care fracture of the head or neck of the humerus often results in more or less stiffness of the shoulder. It is desirable that such fixation as may occur should be with the humerus at a right angle to the scapula, thus providing for a useful range of arm motion through the shoulder-blade.

Fracture of the upper end of the humerus is a common accident among the aged. Some of these individuals, with poor cardiac function, one might hesitate to keep continuously in bed even for a fortnight. However, they would less well tolerate a plaster cast or an aeroplane splint. For them we would not attempt to secure a maximum recovery but, sacrificing reduction or abandoning traction after a very few days, we would apply abduction with a swathe or sling passing about the arm and attached to the head of the bed, securing so much of external rotation as we are able to get by pillow support of, and gauze loop attachments to, the forearm; and we would continue this bed treatment for only a few hours at a time, permitting the patient also to walk about, or to sit in a chair, with the arm abducted by an attendant or on pillows.

For uncomplicated fracture of the greater tuberosity of the humerus, with little displacement, we would use a somewhat similar plan of abduction treatment to be applied at night, which obviates the development of "stiff and painful shoulder," yet allows the patient to attend to his business (with the arm in a sling) during the day—this to be followed by exercises with a light Indian club.—W. M. B.

COMMENT AND CORRESPONDENCE

STRANGULATION OF A HERNIA SAC

In his report of a case of supposed strangulation of a hernia sac, in this issue of the JOURNAL, Dr. H. T. Miller is quite correct, we believe, in stating that no such condition has hitherto been recorded; and we believe that he is right in thus publishing an account of a finding that, if not unique, is at least very unusual. His description makes out a very good case, indeed, for his assumption that the gangrenous tissue he encountered was the hernial sac. Not easily explained on that basis, however, are the serpiginous veins at the neck of the mass. Nor are quite clear Miller's hypotheses concerning the behavior of the omentum and the intestine in his discussion of his case. He makes no mention of fluid within the mass; observation of analogous conditions would lead us to expect that if gangrene of the sac were caused by strangulation (which, however, Miller does not assert) it would contain serous or sero-sanguinous fluid. However, we are at a loss to offer any explanation other than his of the gangrenous mass; and we regret that his report did not include a closer study of the tissue after removal.

So unusual is the case that we sought the opinion concerning it of Wm. B. Coley, than whom no American surgeon has had a larger experience in hernia or a wider familiarity with its literature. Following is his comment—Ed.

Dr. Miller of Springfield had already written me fully about his case of supposed strangulation of the hernial sac, and asked me if I had had any experience with a similar condition. I have observed no such case either in a series of 12,000 operations performed at the Hospital for the Ruptured and Crippled or in nearly 2000 operations personally performed at other hospitals; nor do I know of any such case reported in literature.

Personally, I cannot conceive of a hernial sac becoming gangrenous unless due to a secondary gangrenous condition of the contents of the sac (omentum, bowel, or appendix). I had one case two years ago at the Sharon Hospital in Sharon, Conn., which was almost identical with the description of Dr. Miller's case; the sac was quite gangrenous, one-quarter of an inch thick, but the contents of the sac, when finally discovered, proved to be a long gangrenous appendix; the appendix and sac were so thoroughly glued together that it was almost impossible to separate them; they appeared to be one gangrenous mass. If, in my case, one had made an incision high up, the finger would have entered the abdominal cavity freely but likewise would have discovered the base of the appendix at its junction with the cecum.

In Dr. Miller's case, it seems to me possible that the gangrenous appendix and the sac could have been so firmly united as to be regarded as sac only, and if this were tied off high, the simple ligature might have been quite sufficient to cure the appendicitis; that is the procedure (simple ligature) that is still used by many of the best surgeons with very satisfactory results.

If, as Dr. Miller suggests, the gangrenous sac had been due to a mass of gangrenous omentum, it does not seem possible that such a mass could have been reduced in the abdominal cavity without producing a peritonitis; it certainly would not have been reduced spontaneously, and in all probability, it adhered to the sac itself and made impossible reduction by manipulation. It is still more improbable that a portion of strangulated bowel could have produced gangrene of the sac without first having become gangrenous itself; and if such portion of the intestine had been reduced, it certainly would have produced a peritonitis. It is very difficult to give a rational explanation of the case.

WM. B. COLEY.

PROGRESS IN SURGERY

Selections from Recent Literature

HALOGEN SOLUTION IN WOUND TREATMENT. (*Eine Halogenlösung zur Wundbehandlung*). Paul Albrecht, Vienna. *Wiener klinische Wochenschrift*, July 1, 1926.

The author calls attention to the fact that in the war while the Allies used a chlorine solution in the treatment of wounds, the Central Powers employed an iodide solution with the same purpose and almost equivalent results. The chlorine solution has the advantage of rapid effect; the iodide solution, however, gives a more prolonged though not as powerful antiseptic result. The effort of the author was therefore directed toward combining the desirable effects of both these solutions. This he has accomplished in what is called solution X. It is a composition of chlorine, iodine and fluorine. It is a yellowish, watery, hypertonic solution with a hydrogen-ion concentration of 6.0. It decolorizes after long exposure to the air and sunlight. It is not irritating to the skin. The solution has been used in the treatment of grossly contaminated wounds as well as in clean wounds. It appears to be non-irritating to serosal as well as to mucosal surfaces.

While the exact modus operandi of the halogen solutions has not been definitely determined, it is believed that their antiseptic properties are due to the increased hydrogen-ion concentration. This leads to a local acidosis as well as to a swelling of the tissue colloids and a consequent increase in adsorption power. The work on this solution is not as yet completed. It can at present be obtained from only one chemical firm in Vienna, the address of which is given.

STREPTOCOCCIC SEROTHERAPY AND THE BLOOD PICTURE. (*Streptokokkenserotherapie und Blutbild*). Hans Lehfeldt, Charlottenburg. *Zentralblatt für Gynäkologie* No. 24, 1926.

In cases of puerperal and surgical streptococcic sepsis successfully treated with antistreptococcus serum, the author noticed a relative lymphocytosis, a reappearance of eosinophiles and a shifting backward toward the right in the Arneth blood picture. Experimental intraperitoneal injections of streptococci called forth the same reaction in the white mouse as in the human being. The changes in the blood picture are similar to those found in human streptococcus infection. Following injection of antistreptococcus serum, there is a definite change in the blood picture corresponding with that mentioned above as occurring in the human being. Mildly infected mice recovered more quickly than those to whom no serum has been given. Severely infected mice lived longer after serum treatment than those without serum. Untreated or insufficiently treated severe infections lead to death within 24 hours.

The author calls attention to the fact that the data here presented may be of some value prognostically and therapeutically. By means of the definite change in the blood picture, it should be possible to determine whether there is any tendency toward improvement and whether that is due to the use of the serum or is merely coincidental.

GAS BACILLUS EMBOLUS AFTER ABORTION. (*Gasbrandembolie nach Abort.*) Strassmann Erwin, Berlin. *Zentralblatt für Gynäkologie*, 1926, No. 22.

The author reports an interesting case in which gas bacillus sepsis developed after the performance of a criminal abortion. Gas bacillus infection is apparently more frequent now than before the war. In infections of the uterus, it may appear in two forms, the emphysematous, in which gas develops within the uterine cavity, or the interstitial, in which the infection is confined to the uterine wall. It is this latter form which leads to the subsequent development of general sepsis or gas bacillus peritonitis. In the case here presented, a general sepsis developed as the result of a septic embolus to the lung. The clinical picture as well as the pathologic findings, both gross and microscopic, are described in great detail. There is appended a bibliography of the more important contributions on this subject.

NEW MEDICAL AND SURGICAL APPLICATIONS OF ANTI-GANGRENOUS SEROTHERAPY. H. Vincent, Val-de-Grace. *International Clinics*, June, 1926.

Professor Vincent, who has developed in his laboratory at Val-de-Grace a polyvalent toxin for gas gangrene infections, urges that it should also be used prophylactically in all injuries for which one would use tetanus antitoxin and, therapeutically, in various phlegmonous conditions produced by anaerobic

organisms, often in symbiosis with other bacteria. Among such infections Vincent mentions: Ludwig's angina (which he says was described by Gensoul six years before Ludwig); gangrenous appendicitis and other para-intestinal phlegmons; pulmonary gangrene; certain cases of puerperal metro-peritonitis, certain perivesical infections, prostatitis, periprostatitis, and certain fetid urinary abscesses, etc.

Treatment of Varices by Sclerosing Injections. (*Le Traitement des Varices par les Injections Sclérosantes.*) J. A. Sicard and L. Gaugier. *Presse Mèdicale*, June 2, 1926.

Sicard has been practising this method of treating varicose veins since 1917. It is essentially an ambulatory procedure and does away with the mutilating effects of the extensive operations previously advocated. The treatment consists in the injections of various drugs directly into the veins with the object of causing an obliteration of the dilated portion. Some authors believe this is brought about as a result of a reflex spasm of the musculature but Sicard is of the opinion that following the chemical irritation caused by the injected fluid a flat parietal thrombosis is formed which leads to obliteration of the vein.

The chemical is injected with the patient in the sitting or standing position though it may also be undertaken with the patient prone.

The veins of the leg are injected first and two or even three veins at a distance of 5–6 cm. may be injected at once. The fluid is injected with a small caliber needle directly into the dilated portion. The needle is left in situ for several minutes and immediately upon withdrawing the site of the puncture is compressed with the finger to prevent escape of the fluid into the perivascular tissues. Within five minutes the patient is permitted to leave. Injections may be repeated after the subsidence of the reaction following the first injection.

Some pain is complained of. This may be due either to faulty technique, resulting in perivascular infiltration, or may be due to a cramp of the vessel following the injection. The author has experimented with various agents and believes that chemically pure sodium salicylate is the most desirable. This is used in 20 per cent, 30 per cent, and 40 per cent strengths depending on the tolerance of the patient. The initial dose consists of 2 cc. of a 20 per cent solution. This is gradually increased until as much as 5 cc. of a 40 per cent solution are given. The author warns against the use of small amounts of weak solution because instead of bringing about a thrombosis of the lumen, it results in a sclerosis of the vein wall.

There is no danger of ill-effects, such as embolus, because the essential pathological process is not a phlebitis but a chemical reaction with the formation of a firm parietal thrombus. However, there are certain cases in which the author advises against the application of the method. Plethoric individuals or those suffering from hypertension, cardio-nephritics, and those who have previously undergone a phlebitis of the deep veins of the leg are not good subjects.

Curative Fibrosis of Varices. (*Fibrose Curative des Varices*). G. Delater. *Presse Médicale*, June 2, 1926.

In certain cases, the salicylate of soda injections recommended by Sicard in the treatment of varicose veins seem to be without effect after the first several injections. In such cases, Delater advocates the substitution of quinine for the salicylate. He proceeds in the following manner. The patient is first injected with 2 cc. of a 20 per cent solution of sodium salicylate. If this proves inefficacious the patient is treated with 2 cc. of a 30 per cent and 4 cc. of a 40 per cent solution. If the results are satisfactory, the treatment is continued. Otherwise, the author replaces the salicylate by the following solution; quinine hydrochloride 0.45, urethane 0.23; distilled water 3.0. At the first injection 0.5–1 cc. of this solution is injected. At subsequent treatments the quantity may be increased until the patient is getting 3–4 cc. In the experience of Delater, this solution is occasionally successful where sodium salicylate fails. Sometimes after the use of quinine, the salicylate may become more efficacious.

Granuloma Inguinale. Clinical Observation, Vaccine Treatment and Allergic Reactions. Max Goldzieher and Samuel M. Peck, New York. *Archives of Dermatology and Syphilology*, July, 1926.

Seven cases of granuloma venereum were studied. The diagnosis was made by the characteristic clinical appearance; demonstration of *bacillus venerogranulomatis* in smear, section and culture; complement fixation and allergic skin reactions. The best therapeutic results were obtained by the combined use of *bacillus venerogranulomatis* vaccine, with tartar emetic.

The Rôle of a Specific Bacterium in the Production of Urinary Calculi. Benjamin H. Hager and Thomas Magath, Rochester, Minn. *International Journal of Medicine and Surgery*, June, 1926.

The authors believe that *proteus ammoniæ* after invading the bladder can, under favorable

conditions, produce true vesical calculi. The mechanism by which such stones form is probably a continuous precipitation, on already existing lesions, of the alkaline inorganic salts resulting from the alkalinity of the urine produced by *proteus ammoniæ*.

STAPHYLOCOCCUS INFECTION OF THE RENAL PARENCHYMA. Paul W. Aschner, New York. *The American Journal of the Medical Sciences*, July, 1926.

Staphylococcus infection of the kidney parenchyma is usually metastatic from a boil, carbuncle, paronychia or other peripheral lesion. In the acute cases perinephric suppuration develops early and the diagnosis is relatively easy. In the subacute and chronic cases the clinical manifestations are so variable as to simulate various types of thoracic, abdominal and spinal disease. The absence of striking urinary symptoms and urinary changes, the indeterminate results of cystoscopic and bacteriologic examinations all tend to make the diagnosis of cortical abscess or carbuncle of the kidney a difficult one. It is only by bearing the condition constantly in mind, and by giving proper attention to the search for a preceding peripheral infection by staphylococci that the insidious cases may be recognized. The evaluation of provocative vaccine injections must await a more extended experience with the method.

Some of these infections undoubtedly resolve without frank suppuration. The prognosis with proper surgical therapy in young adults is excellent. In children and in older adults it is a graver affection, particularly if other metastatic lesions or venous involvement occur. Nephrectomy is necessary in few cases, such as those with widespread involvement of the renal parenchyma and persistent bacteriemia.

[See also the JOURNAL, May, 1926, page 99.]

FURTHER STUDIES ON PYELITIS. Henry F. Helmholz, Rochester, Minn. *Southern Medical Journal*, July, 1926.

Histologically the experimental lesions of pyelitis in rabbits approximate those found in infants. Healing of acute suppurative lesions of the kidney is extremely rapid and complete.

Experiments on the appearance of bacteria in the urine after intravenous injection do not bear out the contention of those who maintain that they appear in a few minutes. They were never found in four hours or less. Acute staphylococcic lesions of the kidney do not favor localization of colon bacilli injected intravenously.

In cases of acute pyelitis of rabbits hexamethylenamin was found more effective in treatment than hexylresorcinol or mercurochrome. In cases of chronic infection of the urinary tract in children, hexylresorcinol, used in the dosage and for the period indicated, had practically no effect. Hexamethylenamin proved successful in most uncomplicated cases in two weeks or less.

THE TRIGONE OF THE BLADDER AS A FACTOR IN URINARY OBSTRUCTION. WITH REPORT OF CASES AND DISCUSSION OF OPERATIVE TREATMENT. Frank Hinman and Miley B. Wesson, San Francisco. *Surgery, Gynecology and Obstetrics*, July, 1926.

Hypertrophy of the interureteral ridge may result from chronic vesical irritation, from mild types of vesical or infravesical obstruction or from both in combination. It may be of a type and in a position to produce in themselves obstruction to urination.

An obstructing interureteral bar or ridge is always an acquired condition though the cause may be congenital. It may also result from chronic ulceration, usually tuberculous, which has led to a dissected or undermined trigone. Marked obstruction from an hypertrophied ridge seems to be due principally to the hydrostatic undermining of the trigone back of it, a position practically immune to the formation of diverticula.

The treatment is surgical by suprapubic cystotomy and (1) either incision of the ridge with suture and ligature of the incised edges to control hemorrhage, or (2) resection of the edge and the supratrigonal pouch with restoration of the base of the bladder, which is the preferable method when these pouches are deep.

Before operation for an hypertrophied interureteral ridge, in case it has been secondary to obstruction, the primary obstruction should first be removed and a period of time allowed to elapse so that it may be seen whether the removal of the original obstruction will not cause a disappearance of the interureteric hypertrophy.

URETERAL STRICTURE—SYMPTOMS, TREATMENT, COMPLICATIONS, AND RESULTS. A STUDY OF SEVENTY-SIX CASES. Alexander Hamilton Peacock and Raymond Fisher Hain, Seattle. *Surgery, Gynecology and Obstetrics*, July, 1926.

These authors find that ureteral stricture is not an uncommon disease. Focal infection and diseases caused by streptococcic infection seem to play some part in their formation. They are more frequent in women than in men.

Renal colic is frequently caused by ureteral stricture, and simulates calculus. Many obscure abdominal pains may be traced to ureteral stricture, and are relieved by dilatation.

A number of abdominal operations have been performed needlessly, as ureteral stricture was undiagnosed, and was the cause of the symptoms present.

Some strictures are not dilatable, and must be subjected to ureterotomy or incision.

CAUDAL ANALGESIA IN CYSTOSCOPY. Albert E. Goldstein and T. Jud McBee, Morgantown, W. Va. *The Journal of Urology*, July, 1926.

Two hundred and eighty-six patients received 518 injections. In 455 complete analgesia was successfully induced and in 63 it was unsuccessful. Of the 286 patients 242 received one or more successful injections and in 44 the injections were unsuccessful. In 218 cases, the analgesia was complete in all the injections.

The authors conclude that:

1. Successful caudal analgesia causes sufficient relaxation of the bladder for complete examination and treatment together with marked relaxation of the ureters, the procedure being painless.

2. Caudal analgesia should be employed in the examination and treatment in all cases of irritable bladder, irrespective of the cause.

3. Patients requiring cystoscopic operations or intraureteral manipulations will be more successfully handled if under caudal analgesia.

4. There should be no hesitancy on the part of the urologist to employ caudal anesthesia in patients fearing cystoscopic examinations.

HYSTERECTOMY AND ARTIFICIAL MENOPAUSE. (*Uterusexstirpation und die künstlichen Menopause.*) B. Aschner, Vienna. *Wiener Klinische Wochenschrift*, June 10, 1926.

Following either physiological or artificial menopause, women frequently show evidences of severe psychotic disturbances which the author believes are due to deficiency of the uterus. He has observed that these symptoms appear regardless of whether the ovaries are removed or not and regardless of whether the uterine function disappears normally or as a result of surgery or the use of the *x*-ray. He therefore insists on the necessity of conserving uterine function and advises the performance of myotomy or wedge resection of the uterus in cases of fibromyomata.

PATHOLOGY AND THERAPY OF HEMORRHAGES OF OVARIAN ORIGIN. (*Pathologie und Therapie der ovariogenen Blutungen.*) J., Novak, Vienna. *Medizinische Klinik.*, June 4, 1926.

The author presents a clear-cut and consequential picture of the relationship between ovarian and uterine physiology. In his opinion, a great number of the meno- and metrorrhagias are to be considered not as separate disease entities but as evidences of one and the same fundamental process, disturbed ovarian function. Even certain forms of amenorrhea are due to this same disturbance in the cycle of ovarian changes. Normally a single ovum ripens in its follicle and brings about the premenstrual changes in preparation for fecundation. If this does not occur, the ovum dies, the corpus luteum undergoes changes and a ferment is set free which causes a rupture of the uterine vessels and the onset of menstruation. If by reason of some ovarian dysfunction several ova are brought to a ripened state at the same time or if several are brought to different stages at the same time, the various forms of amenorrhea and uterine bleeding result. The author consequently directs his attention in treatment to an attempt to regulate the ovarian dysfunction. This he undertakes in the usual manner by the use of styptics, pituitrin, care of the general condition, curettage and partial resection of the cystically degenerated ovary which is at the basis of the whole disturbance.

CHRONIC DUODENAL ILEUS. WITH REPORT OF FIFTY-SIX CASES. C. C. Higgins, Cleveland. *Archives of Surgery*, July, 1926.

Chronic duodenal ileus is not rare and there are undoubtedly many cases that have not been diagnosed. On account of the severe headache associated with this condition a diagnosis of migraine is usually made; some patients have been treated for migraine for years and have passed through the clinics of excellent diagnosticians in a search for relief. In all cases of severe headache associated with vomiting a careful examination of the duodenum should always be made.

In cases in which the dilatation is insufficient to produce duodenal stasis and is associated

with gastroptosis, an effort should be made to secure relief by nonoperative measures. If the dilatation is marked and stasis with antiperistalsis is present, a duodenojejunostomy should be performed. The mortality for duodenojejunostomy is practically nil and excellent results may be expected. Resection of the right colon is indicated in few cases and should be performed only as a last resort. Gastroenterostomy should not be performed, as the stasis in the duodenum is not relieved and a vicious circle is established. A comprehensive history and a careful physical examination may suffice to make a correct diagnosis which, however, should be verified by roentgen ray. Dilatation of the duodenum is a clinical entity and a characteristic picture is present in most of the cases.

TUBERCULOUS CERVICAL ADENITIS. Cole B. Gibson. *The American Review of Tuberculosis*, June, 1926.

Tuberculin is of but little importance in our list of therapeutic aids for tuberculous adenitis.

Surgery in competent and conservative hands is applicable to a small percentage of cases, after standard nonsurgical procedures have failed, and in cases in which the removal of lymph nodes is of more importance than the possible development of a paralysis.

X-ray treatment has not yet been established on a sufficiently definite basis to warrant conclusions, but reports seem to indicate bright and favorable prospects.

Heliotherapy is undoubtedly successful in promoting more cures of tuberculous adenitis than can ordinarily be anticipated by other means.

The Calot method of treatment by aspiration and injection is highly successful when used in conjunction with general heliotherapy. Whether it is any more succeessful than simple aspiration, practised in conjunction with heliotherapy, is doubtful.

The proper treatment of tuberculous adenitis rests upon three points, namely:

Alleviation of causative or underlying processes, such as treatment of infecting foci in the tonsils, adenoids or teeth.

The establishment of good hygiene, with particular attention to good food, fresh air, rest and exercise.

The application of a specific remedial agent, the most satisfactory at the present time, in Gibson's opinion, being heliotherapy, which may in certain instances be aided by aspiration and in even fewer instances by surgery.

BREAST CANCER METASTASIS. W. A. Coventry, Duluth, Minn. *American Journal of Obstetrics and Gynecology*, July, 1926.

This study of 47 five-year-period cases shows very discouraging results in breast cancer after radical operation preceded and followed by radiation.

With experience, one comes more to believe that it is much better to give the patient the benefit of the doubt and remove all fibromas and cystic mastitis; this is a safer procedure than to allow them to remain until a gross diagnosis of cancer can be made.

In view of the fact that when metastasis has taken place even only into the axilla, cancer has undoubtedly spread beyond the control of the surgeon, one cannot help feel that these patients would be far better off without operation.

In view of the fact that skeletal metastasis is common and when once found the prognosis is hopeless, it is better practice in all cases of breast carcinoma to take roentgen pictures of the ileum, head of the femur, and the spine, so as to determine before operation whether there is any metastasis in these parts.

The use of *x*-ray preoperatively and postoperatively certainly has not shown the results that were expected of it.

PATHOLOGICAL FRACTURE OCCURRING IN CHARCOT'S DISEASE OF THE HIP JOINT. REPORT OF A CASE TREATED BY THE WHITMAN ABDUCTION METHOD. Atha Thomas. Denver. *Surgery, Gynecology and Obstetrics*, July, 1926.

This case shows that a good functional result can be obtained in fractures of the hip joint with tabetic arthropathy in which the same mechanical treatment is carried out as in fractures of the femoral neck occurring in normal bone. Whitman's abduction method of plaster immobilization was used. The functional result is excellent and there is apparently a bony union.

ARTHROPLASTY OF THE HIP. AN ANALYSIS OF FORTY-EIGHT CASES. Willis C. Campbell, Memphis, Tenn. *Surgery, Gynecology and Obstetrics*, July, 1926.

Campbell gives his results of 48 hip arthroplasties of which 25 were in patients with ankylosis of both hips. He briefly describes the operation and after-treatment, and recites the principles in selection of cases.

BOOK REVIEWS

SURGICAL ANATOMY OF THE HUMAN BODY. By John B. Deaver, M.D., SC.D., LL.D., F.A.C.S.; Surgeon-in-Chief to the Lankenau Hospital, Philadelphia; Emeritus John Rea Barton Professor of Surgery, University of Pennsylvania. Second Edition. In three royal square 8 vo. volumes, bound in fabricoid; price $36.00. Volume I. Pp. 551; 124 plates. Philadelphia: P. Blakiston's Son & Company, 1926.

The brilliant and indefatigable Deaver has written several large and important surgical monographs—Surgical Anatomy, Appendicitis, Enlargement of the Prostate and Surgery of the Upper Abdomen. These are all authoritative and scholarly and have become classic works of reference that will continue to be studied for many years to come. In the nature of things the one that will longest endure is Surgical Anatomy—a splendid treatise based on careful dissections and original drawings as well as the comparative study of other authorities.

Anatomy does not change but a "surgical anatomy" needs to be revised occasionally to keep pace with the expansion of surgery itself. It is a quarter century since the publication of the first edition of Deaver's and in that period, which has seen manifold technical advances, surgery has reached into parts of the body theretofore seldom entered. This has made necessary, especially, revision and expansion of the sections of the work dealing with the anatomy of the brain and the thorax. This period has, too, seen the establishment of a universal anatomial nomenclature (the BNA), which Deaver has adapted in this edition without, however, discarding the old titles.

This second edition is to appear in three large volumes, in which the contents are now arranged to bring together related anatomical parts, a regional arrangement that best meets the study needs of the surgeon. The first volume, which is before us, is a handsome one devoted to the anatomy of the scalp, cranium, brain, face, mouth, throat and organs of special sense. It shows very careful revision and pictorially, textually and typographically it leaves little to be desired. The new drawings are by Miss Eleanor Paxson.

LEHRBUCH DER TOPOGRAPHISCHEN ANATOMIE, mit besonderer Berücksichtigung ihrer Anwendung. Von John Blumberg, Dozent und Vorstand des chirurgisch-anatomischen Institutes an der Universität Dorpat (Tartu) in Estland. 8vo. 440 Seiten; 152 Abbildungen; Price, 21 marks, unbound. Berlin and Vienna: Urban und Schwarzenberg, 1926.

This is a short but well written review of the essential facts of anatomy. Prepared by a surgeon who has renounced the practise of surgery to devote his time to the teaching of anatomy, the book is presented with special emphasis on the surgical applications of anatomical knowledge. There are constant references to the best method of approaching any particular structure and numberless anatomical suggestions and guides to the surgeon who is perhaps not as conversant with detailed anatomy of particular regions as might be desirable. The work has relatively few illustrations. Such as there are, however, are well chosen and beautifully reproduced.

DIE CHIRURGIE. EINE ZUSAMMENFASSENDE DARSTELLUNG DER ALLGEMEINE UND SPEZIELLEN CHIRURGIE. Herausgegeben von Prof. Dr. M. Kirschner und Prof. Dr. O. Nordmann. *Lieferung* 9. DIE CHIRURGIE DER BAUCHWAND, von Prof. Dr. W. Müller, Rostock; DIE LEHRE VON DEN ÄUSZEREN HERNIEN, von Dr. H. Eggers, Rostock; DIE CHIRURGIE DES BAUCHFELLS UND DES NETZES, von Dr. J. Petermann, Berlin; DIE CHIRURGIE DES WURMFORTSATZES, von Prof. Dr. A. Läwen und Prof. Dr. H. Burckhardt, Marburg. Berlin: Urban und Schwarzenberg, 1926.

As its title indicates, the volume is devoted to a discussion of the surgical conditions of the abdominal wall, the peritoneum, the omentum, the appendix, and herniae. Each of the separate divisions is preceded by a concise description of the anatomical and physiological facts of importance in the recognition and treatment of the different diseases. The section devoted to the abdominal wall treats not only of the various disease entities but gives also a very interesting account of the plastic procedures that may be employed in overcoming abdominal wall defects. In the section on the peri-

toneum, it is of interest to note that the authors, as well as most other German surgeons, advise the use of peritoneal irrigations in the treatment of peritonitis. In other respects, their attitude corresponds very much with the accepted teachings of American surgeons. The two other parts of the work contain excellent discussions of the subjects considered. The whole volume is beautifully and plentifully illustrated with photographs and colored sketches.

Scoliosis. By Samuel Kleinberg, M.D., F.A.C.S., Assistant Surgeon, New York Hospital for Ruptured and Crippled; Chief of Orthopedic Service, Israel Zion Hospital of Brooklyn; Consulting Orthopedic Surgeon, Rockaway Beach Hospital; Attending Orthopedic Surgeon, Israel Orphan Asylum; Associate Surgeon, Lebanon Hospital, New York. 8 vo. Pp. 311; 140 illustrations. Price $6.00. New York: Paul B. Hoeber, Inc., 1926.

The growth of specialism, the increasing complexities and the multiplying facts of medicine have created the need for monographs. The best of the text-books and "systems" of general surgery are inadequate as expositions of the subjects included in orthopedics; and the best of the treatises on orthopedics needs must fall short of telling all that one might want to read concerning scoliosis. Kleinberg's admirable monograph was written to do just that. It is intended primarily for the orthopedic specialist but etiology, pathology and treatment are so described "that the general practitioner will find it as easily comprehensible as the inherent difficulties of the subject will permit."

The work is a well balanced product of excellent training and long experience in orthopedics, in which the author has devoted much of his attention to scoliosis. In this he has been favored with, especially, the large clinical and statistical resources of the N. Y. Hospital for the Ruptured and Crippled. Kleinberg rides no hobby in the treatment of curvature of the spine; and he urges no method and no mechanical theory as superior to the others. He dispassionately describes the various standard methods of treatment and the rationale of each: forcible correction in extension; forcible correction in flexion (Abbott); traction over a convex frame; operative fixation; gymnastic exercises. He has not cumbered his book with descriptions of the many apparatus for forcible correction and mentions only those of Lovett, Adams, Wullstein and Abbott. Kleinberg speaks favorably of a system of treatment evolved at the Hospital for the Ruptured and Crippled "which bids fair to replace other methods of treatment in a large but selected group of cases." This consists in, first, a period of traction over a convex frame, as suggested by Whitman, to be employed for several weeks preliminary to, second, operative fixation (fusion, as introduced by Hibbs), and then, third, a period of support by external apparatus. Although it involves recumbency Kleinberg prefers traction on the convex frame to plaster jackets and braces, for the method is painless and takes less time.

The only important therapeutic advance in scoliosis within recent years has been operative fixation to prevent increase of the curvature. To this, technically as well as in clinical observations, Kleinberg has contributed much. The operation he performs combines the features of Hibbs', Albee's and Forbes' spinal fusion methods, and is intended to meet the difficulties presented by severe deformities. He reports 33 operations, all followed by primary wound healing, although in one there was a later extrusion of the bone graft. In two cases the original deformity recurred; in the other 31 the operation maintained the degree of reduction secured by the frame and traction treatment.

Kleinberg does not share with Hibbs the belief that scoliosis commonly results from poliomyelitis. Without committing himself, he calls attention to Buchman's observation of roentgenologic evidences of vertebral epiphysitis in cases of idiopathic scoliosis. Buchman's hypothesis that this epiphysitis, probably akin to epiphysitis in more familiar sites, is the essential cause of structural scoliosis, has much to commend it. It provides a rational basis for an otherwise altogether obscure development and it constitutes, so far as we know, the only serious contribution to the question of the etiology of the disease that has been made for some years.

At best, the treatment of structural scoliosis is very tedious, and the results leave much to be desired. As Kleinberg says, with none of the "three more or less distinct methods of treatment . . . can we at present hope to cure a case of structural scoliosis no matter how mild it may be." The curve does not much yield to forcible (or gymnastic) straightening.

For that reason Steindler is now advocating treatment by the development of compensatory curves.

Postural scoliosis, its prophylaxis and treatment, are adequately dealt with, and there is a chapter on congenital, rachitic and paralytic scoliosis.

This is a welcome addition to recent surgical monographs. It is sound in substance, interesting in style, and attractive in typography and illustrations.

Modern Views on Digestion and Gastric Disease. By Hugh MacLean, M.D., D.Sc., M.R.C.P., Professor of Medicine, University of London, and Director of the Medical Clinic, St. Thomas' Hospital; Honorary Consulting Physician to the Ministry of Pensions; Consulting Chemical Pathologist to St. Thomas' Hospital. 8 vo. Pp. 170; 14 charts and 23 figures. Price $4.00. New York: Paul B. Hoeber, Inc., 1926.

This little monograph on digestion and gastric diseases will prove interesting to students and practitioners, although its analysis of the subject presents no originality. A large number of the references are to publications from the United States. Fractional analysis of the stomach contents is still given an importance which Americans are beginning to discount. The chapter on *x*-ray diagnosis is satisfactory; but the section on flatulence is unconvincing. MacLean ignores the subject of visceral reflexes in diagnosis. Gastroenterostomy is recommended, but its disadvantages are not mentioned, and subtotal gastrectomy is not referred to. A modification of Sippy's diet is described but without credit.

Progressive Medicine. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M.D., LL.D., Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College, Philadelphia; Physician to the Jefferson Medical College Hospital; etc.; assisted by Leighton F. Appleman M.D., Instructor in Therapeutics, Jefferson Medical College, Philadelphia; Ophthalmologist to the Frederick Douglas Memorial Hospital and to the Burd School; Attending Surgeon to the Wills Eye Hospital. Volume II. June, 1926. 8 vo. Pp. 408. Philadelphia and New York: Lea & Febiger, 1926.

This volume of Progressive Medicine contains a splendid résumé of the year's accomplishment in the fields covered: hernia; surgery of the abdomen; gynecology; disorders of nutrition and metabolism; diseases of the glands of internal secretion; diseases of the blood and spleen and ophthalmology. There is more than customary obtrusion of personal opinion and accomplishment in the review of abdominal surgery; and in this section there are numerous annoying misprints.